LAYING THE FOUNDATIONS
Settling objectives and identifying needs for Victoria’s 30-year infrastructure strategy
What this paper is about

This paper lays the foundations for Infrastructure Victoria’s 30-year strategy. It is the second in a series of papers, which will culminate with the release of the final strategy by the end of 2016 (the first was From the ground up, published in November 2015).

This paper sets the scene for the strategy, outlines Infrastructure Victoria’s guiding principles and proposes a set of draft objectives and needs for consultation. It is complemented by technical documents, which will be available at yoursay.infrastructurevictoria.com.au.

You are encouraged to provide feedback on the draft objectives and needs by participating in online forums or making a formal submission. This is your chance to have a say on what Victoria's 30-year infrastructure strategy should be aiming to achieve and what challenges and opportunities need to be addressed.

What this paper is not about

This paper stops well short of identifying solutions. It does not propose options for meeting infrastructure needs or make recommendations to government.

In the second quarter of 2016, once the objectives and needs have been confirmed, Infrastructure Victoria will release a paper outlining potential options to manage demand, use existing assets better and expand or build new infrastructure. We will then seek further feedback and host two citizen juries (see page 79 for more information).

In the third quarter of 2016, once all the options have been considered, Infrastructure Victoria will release a draft strategy and again consult with stakeholders and the community to test the proposed recommendations.

By the end of 2016, Infrastructure Victoria will publicly present a final set of recommendations. The final strategy will help set the direction of infrastructure planning in Victoria for the next 30 years.
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We live in a connected world. Victoria is connected to other states and countries, just as regional Victoria is connected to Melbourne. Our society, economy and environment, and in turn our infrastructure, are influenced by global trends and local issues. These trends and issues affect different sectors in different ways. Understanding this context is critical for planning Victoria’s infrastructure over the coming decades.

The purpose of this paper is to lay the foundations for Victoria’s 30-year infrastructure strategy (which will be released by the end of 2016). Most importantly, it proposes draft objectives and needs for consultation (see next page for a summary). It also outlines Infrastructure Victoria’s commitment to consult and collaborate, drive improved outcomes, draw on compelling evidence, consider non-build solutions first, promote responsible funding and financing and be open to change.

We are seeking your feedback on the draft objectives and needs. We look forward to hearing your views on what the strategy should be aiming to achieve, as well as what infrastructure challenges and opportunities need to be addressed.
## Summary of draft objectives and needs

<table>
<thead>
<tr>
<th><strong>DRAFT OBJECTIVES</strong></th>
<th><strong>DRAFT NEEDS</strong></th>
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| 1 Respond to population growth and change | A. Address infrastructure deficits in high-growth areas  
B. Manage increasing demands on health infrastructure  
C. Provide access to high-quality school facilities |
| 2 Support healthy, safe and vibrant communities | A. Enable physical activity through infrastructure and urban design  
B. Provide good public spaces where communities can come together  
C. Strengthen access to cultural infrastructure  
D. Maximise positive impacts on amenity and wellbeing from infrastructure |
| 3 Reduce disadvantage | A. Improve accessibility for people with disabilities and/or mobility challenges through infrastructure  
B. Address housing affordability challenges with better social housing  
C. Support changing approaches to social service and justice delivery through infrastructure |
| 4 Enable workforce participation | A. Provide access to the diversity of employment opportunities offered by the central city  
B. Provide better links to non-central city employment centres  
C. Improve access to early childhood care facilities |
| 5 Lift Victoria’s productivity | A. Improve the efficiency of freight supply chains through infrastructure  
B. Move people to and from airports more efficiently |
| 6 Support Victoria’s changing, globally integrated economy | A. Boost tourism through infrastructure provision  
B. Enable the growth of a highly skilled, digitally connected workforce through infrastructure |
| 7 Promote sustainable production and consumption | A. Improve rural and regional water security  
B. Manage pressures on landfill and waste recovery facilities |
| 8 Protect and enhance natural environments | A. Help preserve natural environments and minimise biodiversity loss through infrastructure  
B. Improve the health of waterways through infrastructure |
| 9 Support climate change mitigation and adaptation | A. Smooth the adjustment to a carbon-constrained world through infrastructure  
B. Adapt infrastructure to changing climate conditions |
| 10 Build resilience to shocks | A. Improve the resilience of critical infrastructure to disruptive events  
B. Address infrastructure-related emergency response challenges |
SETTING THE SCENE

Photo title: AAMI Park and Melbourne CBD by Peter Glenane
Global trends

Victoria is closely connected with the rest of the world. Communication, transport, trade and finance links have created a global interdependence where developments in one nation have an impact well beyond its borders. For example, the collapse of the US sub-prime mortgage market had major ripple effects on economies around the world and contributed to the Global Financial Crisis. Equally, climate change, by its very nature, is a global trend – no nation can escape its effects and solutions require global cooperation. The development of global trends is uncertain and constantly changing, so understanding how they are shaping Victoria is an ongoing task.

Technology

Technology is accelerating faster than ever before. Its impact on society and the economy is becoming “exponential”. Technology can improve service quality and allow more efficient allocation of resources. It can also change how infrastructure is used or create new infrastructure needs. Technology will introduce new modes of transport, new forms of energy generation, new health treatments, new ways of learning and new manufacturing methods. Internet of Things and smart devices influence how people demand goods, while the ‘big data’ they generate can help to improve the design and delivery of infrastructure.

For example, technology can assist to manage demand on roads during peak times through regulation and price signals enabled by computerised active traffic management on smart motorways. Medical predictive analytics can use big data to forecast capacity issues and communications technology may allow more efficient use of built infrastructure.

Urbanisation

Globally, more and more people are living in urban areas. By 2050, 66 per cent of the world’s population is projected to be urban, compared to only 30 per cent in 1950.

Urbanisation is usually associated with economic and social transformations, such as greater geographic mobility, lower fertility, higher levels of education and longer life expectancy. Cities are important drivers of productivity because they concentrate economic activity and provide important links with rural areas, between cities and across international borders.

Urbanisation can also bring challenges, especially when the growth is rapid and unplanned and the necessary infrastructure is not in place. Cities need infrastructure for sanitation, transport, energy, communications and social services. Otherwise urbanisation can result in socio-economic disadvantage, pollution, congestion and unsustainable production and consumption patterns.
Victoria is a highly urbanised state and faces many of these opportunities and challenges. To ensure that Melbourne and Victoria’s major regional cities remain efficient, productive and liveable, infrastructure must be planned and delivered in an integrated way. Victoria can learn from urbanisation experiences overseas and the growing attention given to ‘cities policy’.

**Global economy**

The shifting economic weight from developed to developing countries, partly driven by urbanisation, is another trend that is reshaping the global economy, and it will have long-term implications for Victoria’s infrastructure needs. By 2030, 60 per cent of global Gross Domestic Product (GDP) is expected to be generated in developing economies, mostly in Asia. These emerging markets will increasingly become the focus of rising consumption and production and also major providers of capital, skills and innovation.

Victoria’s economy already has strong links to these markets and stands to benefit from their expansion, with demand for quality agricultural goods and education services likely to grow along with other service industries. Infrastructure needs to support the economic opportunities offered by these markets. This means ensuring existing infrastructure is able to adapt to different demands and the type and location of new infrastructure helps maintain and improve Victoria’s international competitiveness in agricultural and knowledge-based industries.

**Climate change**

Climate change is a global environmental issue with implications that transcend every country’s society and economy. The changing climate will affect productivity in many sectors, put more pressure on the natural environment and reduce the lifespan of infrastructure. Extreme weather patterns will result in greater demand for emergency services, utilities and agricultural output. These impacts may have an effect on migration patterns. Actions and policies to reduce greenhouse gas emissions will also create challenges and opportunities in economies around the world.

Infrastructure investments and reforms can enable the transition to a lower carbon economy while minimising the cost and social disruption involved and taking advantage of the broader benefits due to increased productivity and the growth of new industries. For example, new infrastructure would be required to build and connect large-scale projects to the electricity grid, such as solar power in the state’s north. Distributed energy storage infrastructure will also be important for facilitating the penetration of intermittent energy sources, such as wind and solar. Equally, other infrastructure assets may become stranded in a decarbonised economy, such as those used by extractive industries.
Social, economic and environmental changes are shaping Victoria. Some trends are linked to global drivers, while others relate to policy choices or conditions specific to Victoria. There are many similarities between regions, but also key differences that relate to the varied environmental conditions, population profiles and local economies across the state.

LODDON MALLEE NORTH
- Today: ~126,500 people. 2046: ~160,000 people.
- Relatively diverse community profile, along with highly mobile groups of seasonal and transient workers.
- Agriculture central to economy with strong irrigation network and growing domestic and Asian demand. Natural advantage for solar energy sector.
- Continuing drought and irrigation systems damage river condition, likely to worsen in future and threaten agriculture, especially horticulture.

WIMMERA SOUTHERN MALLEE
- Today: ~48,000 people. 2046: ~55,000 people.
- State’s highest percentage of people aged 65+ (20.7%). Small town population decline.
- Economy focused on cropping and grazing. Significant nature-based tourism assets.
- Likely challenges to agriculture include higher temperatures, less rainfall and associated changes to flowering, planting, pest and disease. Risks to threatened flora and fauna.

GREAT SOUTH COAST
- Today: ~102,000 people. 2046: ~125,000 people.
- Warrnambool one of state’s faster growing regional cities.
- Productive land, moderate temperatures and good rainfall support strong food and fibre sector, likely to benefit from increased Asian demand. Renewable energy opportunities.
- Coastline vulnerable to sea level rise. Threats to waterways used by commercial and recreational fishers.

CENTRAL HIGHLANDS
- Today: ~193,000 people. 2046: ~315,000 people.
- After Melbourne, state’s second lowest proportion of people aged 65+ (15.2%).
- Ballarat: Victoria’s third biggest city, and a major commuter region to Melbourne. Key industries are hospitality, retail, professional services and a growing education sector.
- Potential growth in rural areas with increased food and fibre production, extractive industries, forestry and renewable energy.
- Likely to experience more frequent fires, higher temperatures and less predictable rain.

LODDON MALLEE SOUTH
- Today: ~195,000 people. 2046: ~295,000 people.
- Bordgai: Victoria’s fourth largest city, with commuter travel patterns suggesting jobs are more ‘contained’ to region than Ballarat.
- Bordgai’s economic growth driven by service sectors, manufacturing and tourism. Strong arts scene.
- Natural environment threatened by soil disturbance, salinity and vegetation loss.

HUME
- Today: ~276,500 people. 2046: ~375,000 people.
- Includes regional cities, townships, rural residential areas, relatively isolated communities and alpine resorts.
- Located strategically along major transport routes. Varied industry base with productive agriculture sector, especially in Goulburn Valley.
- Tourism likely to face reduced snow depth and shorter seasons from environmental changes.

GIPPSLAND
- Today: ~273,000 people. 2046: ~415,000 people.
- Townships in south-west (closer to Melbourne and near the coast) have experienced higher levels of population growth than other parts of Gippsland in recent decades.
- Economy based on natural resources and commodities – produces 90% of Victoria’s electricity. Strong nature-based tourism sector emerging.
- Vulnerable to sea level rise and more frequent bushfires.

MELBOURNE
- Today: ~4.6 M people. 2046: ~7.1 M people.
- Nearly 80% of state’s jobs by 2046.
- Outer suburbs fastest growing in Australia, especially north and west.
- Mismatch between job and population growth. Central Melbourne: 48% of jobs growth vs 8% of population growth. West subregion: 9% of jobs growth vs 24% of population growth.
- More affordable housing in outer Melbourne, but poorer access to jobs and services.
- Dominant age profiles differ across subregions: young people in centre, older people in east, families in west.
- Pressure on biodiversity from expanding population and settlement. Risks from increased heatwaves and fires.

GEELONG (G21)
- Today: ~284,500 people. 2046: ~430,000 people.
- Geelong: Victoria’s second largest city. Slightly older than average population with sustained residential expansion in recent years and a large Melbourne commuter population.
- Economy in transition: shrinking manufacturing sector and growing services industry supported by expanding and denser urban area and larger workforce catchment.
- Dry soil salinity likely to increase, impacting local agriculture and food production. Increased bushfires and sea level rise may affect tourism.
Snapshot of sectors

Demand drivers in different sectors include a range of local and global factors, such as population growth and change, technological advances, globalisation, climate change, consumer behaviour and community expectations.

**SCIENCE, AGRICULTURE AND ENVIRONMENT**

The science sub-sector will be influenced by Victoria’s integration with the global economy, including exposure to new ideas and products. Global shocks, hazards and pandemics can also spur increased demand for research. The agriculture and environment sub-sectors will be influenced by changing settlement patterns and weather variations, which will alter land uses.

**ENERGY**

Demand for electricity is expected to remain relatively stable, while demand for gas is expected to marginally decline. While this will be driven by the location and distribution of population growth, pricing and energy efficiency measures may change demand levels. Policy changes to encourage the uptake of renewable energy combined with technological innovation such as domestic battery storage will potentially reduce maximum demand.

**TRANSPORT**

The level and distribution of population growth across Victoria, combined with the location of activities such as employment, will be the primary factors driving people’s demand for transport. The sector will be impacted by changing technologies, like driverless vehicles, which influence demand. While demand in the freight sector will be driven by population and economic growth, it will also be influenced by changing consumer behaviour and changes to methods of production, such as 3D printing.

**JUSTICE AND EMERGENCY SERVICES**

Demand in the justice sector is driven by population growth and community expectations. It will also be influenced by changes to policy and legislation. Demand for emergency services is predominantly response driven by major events like severe weather patterns and changing community expectations about how the sector will respond.

**EDUCATION AND TRAINING**

The education and training sector will be affected by the distribution of population growth across the state and changing rates of international migration. In the higher education and training sub-sector, shifts to a knowledge-based economy and increasing growth in global economies will drive student demand for qualifications. The sector will be influenced by changing technology, which will affect how education and training services are delivered.

**WATER AND WASTE**

Demand for water in urban areas has declined, while regional demand remains stable. This will be impacted by variations in the climate, particularly for regional and rural communities, who are more exposed to these shifts. Demand in the waste sector, while driven predominantly by population growth, will also be influenced by changing consumer behaviour which will result in changes to both the quantity and quality of waste we produce.

**ICT**

Demand for ICT services is expected to increase as Victoria shifts to a service economy and integrates with the global economy. The magnitude of these changes will be affected by technological changes and innovations. Changing user behaviours and increasing expectations about the speed and accessibility of ICT services will intensify demand.

**HEALTH AND HUMAN SERVICES**

Demand for health and human services will predominantly be influenced by the distribution of population growth across Victoria and the demographic profile of individual communities. Demand will also be impacted by changing risk factors such as the rate of obesity, sedentary lifestyles and urbanisation.

**CULTURAL, CIVIC, SPORTING, RECREATION AND TOURISM**

Though there is a diverse range of drivers that influence the cultural, civic, sporting, recreation and tourism sub-sectors individually, together they are influenced by community expectations about the quality of life. There is a growing desire to be connected to both local and international communities.
Putting things in perspective

It’s impossible to predict how Victoria will change over the next 30 years, but we know it will be a very different place by 2046. Technology is likely to be a major disrupter, changing how we go about our daily lives and how our economy functions. Social norms and expectations are also likely to change, putting new and different demands on infrastructure.

### 30 YEARS AGO
- **4.2 million**
- **Manufacturing**
- **Pollution**
- **In store**

### TODAY
- **6.1 million**
- **Manufacturing/Services**
- **Climate change**
- **Online**

### IN 30 YEARS
- **9.4 million**
- **Services**
- **Sustainable cities**
- **At home**
Funding and financing

Victorians want more infrastructure, but this comes with a cost. Funding decisions affect who pays for infrastructure, how much infrastructure is provided and how people use infrastructure.

Funding and financing are separate but related concepts, which are often confused. Funding is the total revenue required to pay for infrastructure and its associated cost over time. Financing can be raised via debt, equity or cash reserves and is used to pay for the construction of infrastructure at a point in time. How government finances infrastructure changes the timing of when funding is needed to meet the financing commitments of an infrastructure project. The two concepts are related as the cost of finance impacts on the amount of funding required for a project.

Paying for infrastructure will require tough choices that will affect equity, the economy and how infrastructure is used. Future Infrastructure Victoria papers will explore the impacts of various funding options including:

- direct and indirect user charges such as road and public transport pricing
- beneficiary charges such as land value uplift, developer contributions and betterment levies
- privatisation of existing assets

Investing in infrastructure usually involves high upfront costs with benefits that accrue in the future. Financing can help to match costs and benefits of infrastructure as well as drive better infrastructure delivery outcomes by allocating risk to the parties best able to manage it. Future Infrastructure Victoria papers will also discuss the advantages and disadvantages of various financing options including government debt and Public Private Partnerships.
MISCONCEPTION: ‘DEBT SHOULD NEVER BE USED TO FINANCE INFRASTRUCTURE’

Debt is a financing instrument that makes funds available at a particular time to pay for the construction of infrastructure. Yet the purposes to which any additional borrowing is applied are important. While a large proportion of the annual infrastructure budget allocation is for recurrent-like capital spending, and is therefore best funded through recurrent revenues, a case can be made for using debt to fund major infrastructure projects that have demonstrable productivity, social and/or environmental benefits over the long term.

Governments need to consider a variety of factors when deciding to increase debt. These include, but are not limited to, the likelihood that interest rates will remain at historic lows, the ability to service the debt in the future, the impact on the state’s credit rating and the government’s desire to invest in other service priorities in the future.
Providing, maintaining and enhancing a society’s infrastructure is an important, ongoing and widespread challenge. Recognising the opportunity to learn from others, Infrastructure Victoria has looked over the fence, and over the horizon, to see how other jurisdictions understand, prioritise and gain lasting benefits from their infrastructure.

Several consistent lessons emerged. The following conditions, practices and mindsets are important to support effective infrastructure planning:

- build consensus through collaboration with the community, industry and all levels of government
- establish a long-term plan to guide coordination and prioritisation, and provide certainty
- focus on how infrastructure can improve social, economic and environmental outcomes
- establish and maintain clear governance structures to prioritise, not politicise
- gather solid evidence to improve analysis, transparency and accountability
- report results to inform public debate and maintain momentum towards a desired future

Victoria’s new approach to infrastructure planning is deeply influenced by the lessons and good practices of other places. This includes:

- a process to identify, agree on and measure progress towards social, economic and environmental objectives
- a collaborative and evidence-based approach involving extensive public, industry and government consultation
- a strategy for the whole state over the next 30 years that looks at all types of infrastructure, and the links between sectors

Want to learn more about infrastructure planning in other places and through history? Start by reading Infrastructure Victoria’s Learning from others and Learning from the past research papers, which will be available at yoursay.infrastructurevictoria.com.au.
Learning from the past

Victoria’s infrastructure landscape is a result of historical decisions and planning made throughout the state’s relatively rapid development. Since the 1920s, planning has been formalised through a series of land use and infrastructure strategies that have shaped Victoria. Throughout its history of planning, the challenge has essentially remained the same: how best to maintain and provide infrastructure in the face of population growth and competing demands on limited resources.

A number of lessons can be learned from the legacy of strategic plans. Those plans that have endured have taken a more integrated approach to planning. Infrastructure Victoria’s 30-year strategy will consider opportunities that encourage the close alignment of infrastructure and land use planning. Many of the best plans have been flexible and have factored in unexpected events. Infrastructure Victoria will take near-term and long-term approaches and will consider future scenarios. The major strategic plans to date have tended to focus on Melbourne and its metropolitan region. Infrastructure Victoria will consider the infrastructure needs of Victoria as a whole. Many plans have been project focused. Infrastructure Victoria will also look at non-build options, such as managing demand and better using existing infrastructure.

MAJOR STRATEGIC PLANS FROM VICTORIA’S PAST

The 1929 Plan of General Development identified the need to reduce traffic congestion, introduced the idea of an open space network and recommended an underground rail network to ease overcrowding on trains. Although this plan was not fully delivered, it laid the foundation of Melbourne’s subsequent plans.

The 1954 Melbourne Metropolitan Planning Scheme Report was the first comprehensive plan to consider broader social infrastructure issues within the health, education and community sectors. The main outcome of the plan was the introduction of a system of land use zones and the reservation of transport corridors, primarily for arterial roads and freeways.

The 1971 Planning Policies for the Melbourne Metropolitan Region proposed a series of ‘green wedges’ providing for public open space, water catchments, agriculture and key facilities essential to city function, such as water treatment facilities and airports. The plan contained Melbourne’s outward growth to a limited number of areas on the edge of the city, shaping the way the city looks today.
Land use planning

Land use planning and infrastructure planning should be closely aligned. Land use planning informs infrastructure requirements, while infrastructure enables the achievement of land use objectives.

*Plan Melbourne* and the Regional Growth Plans provide the strategic framework for land use and development in Victoria and both have been considered by Infrastructure Victoria when developing the draft objectives and needs for this paper.

*Plan Melbourne* is currently being refreshed to incorporate new information and evidence and reflect feedback from earlier consultation processes. Infrastructure Victoria anticipates that the recommendations made in their 30-year strategy will be able to inform future refreshes of *Plan Melbourne* and the Regional Growth Plans. Similarly, future land use plans will inform Infrastructure Victoria’s future strategies, optimising both infrastructure and land use outcomes.

**PLAN MELBOURNE OUTCOMES**

- Delivering jobs and investment
- Housing choice and affordability
- A more connected Melbourne
- Liveable communities and neighbourhoods
- Environment and water
- A state of cities
- Implementation: delivering better governance
Many Victorian Government entities plan and deliver infrastructure for Victoria, as do local councils, companies and non-profit organisations (sometimes in partnership). This reflects the nature of Victoria’s relatively devolved system of governance and often produces great results. The Commonwealth Government also has a role to play, particularly in funding infrastructure of national importance.

To develop the 30-year strategy, Infrastructure Victoria is drawing on the data, knowledge and expertise of these organisations. At the state level, this includes reviewing strategies that have been, or are being, developed by Victorian Government departments and agencies (such as the Statewide Waste and Resource Recovery Infrastructure Plan released in 2015 and the Regional Network Development Plan that Public Transport Victoria is currently preparing), as well as lessons from reports by the Victorian Auditor-General’s Office on infrastructure matters.

We will also take into account work by other levels of government, including Infrastructure Australia’s Australian Infrastructure Plan and will draw on the insights of stakeholder organisations that represent infrastructure planners such as the Committee for Melbourne, Engineers Australia, Infrastructure Partnerships Australia and the Committee for Economic Development of Australia.

Building on this good work, Infrastructure Victoria is in a unique position to add value to infrastructure planning across the state. We were set up as an independent body to help take the politics out of infrastructure planning and have been charged with producing a long-term infrastructure strategy that covers all parts of Victoria and all sectors.
GUIDING PRINCIPLES

Photo title: 2015 Summer Architecture Commission by John Wardle Architects at NGV International by John Gollings
Infrastructure Victoria has developed a set of guiding principles for our work on the strategy and beyond. The principles reflect many of the requirements in the Infrastructure Victoria Act 2015.

Infrastructure Victoria’s guiding principles

Consult and collaborate

Infrastructure Victoria will engage with the community and stakeholders in an open and meaningful way.

Given the constrained fiscal environment, difficult choices will need to be made about the future of Victoria’s infrastructure. The 30-year strategy, in particular, provides an opportunity to listen to different viewpoints and build consensus.

Infrastructure Victoria will also collaborate closely with federal, state and local government entities. The relationship with Victorian Government departments and agencies will be particularly important as we all work towards the same goal of improving social, economic and environmental outcomes for the state.

Drive improved outcomes

Infrastructure Victoria will take a triple bottom line approach to all our work, with the aim of achieving improved social, economic and environmental outcomes.

Infrastructure has the capacity to both respond to, and influence, our society, economy and the environment, so we will consider all three when providing advice.

Getting the right balance between social, economic and environmental considerations will not always be easy, but the best advice will seek to achieve positive outcomes across all three domains.

Use evidence wisely

Infrastructure Victoria will draw on detailed, objective evidence to support better, more informed decision-making. This will require careful research, modelling and scenario planning, as well as access to information and expertise from across government, academia, industry and non-profit organisations.

The evidence we use will be shared with the community. Transparency will ensure scrutiny of our assumptions and methodologies and enhance public debate.

Infrastructure Victoria recognises that, in some cases, the evidence required for decision-making may not exist or be fit for purpose. In others, even the best available evidence will not mitigate uncertainty entirely. In this context, we will seek to preserve options to provide more flexibility in future and identify solutions that meet a range of possible needs.
Consider non-build solutions first

Infrastructure Victoria recognises that building new things often isn’t the best way to meet infrastructure needs. Taking steps to manage the demands placed on infrastructure and using the assets we already have more efficiently can be cheaper and better options.

Major projects will continue to be an important part of the infrastructure planning landscape, but, wherever possible, Infrastructure Victoria will look at non-build solutions first.

Promote responsible funding and financing

Infrastructure Victoria does not fund infrastructure directly, but our advice, if taken, could have major budgetary implications.

Victoria’s fiscal position is relatively sound. However, over the long term, revenue growth may struggle to keep pace with growth in spending, particularly on health and, as such, ongoing sustainable fiscal management will be important.

Funding infrastructure responsibly means making hard choices about what to fund and what not to fund. This includes looking at non-build solutions and taking into account lifecycle costs. Financing infrastructure responsibly also means making hard decisions about how and when the community pays for infrastructure. This includes looking at when the costs and benefits of infrastructure are incurred, getting value for money and considering all the funding and financing options available.

Be open to change

Infrastructure Victoria recognises that improving outcomes rests, in part, on our willingness to embrace change so it can be used to our advantage.

For infrastructure, this could mean adapting existing assets, building flexibility into planning processes and responding to or adopting new technologies.

Disruptive technologies have perhaps the greatest potential to change the way our society, economy and environment function. They are also the greatest unknown from an infrastructure planning perspective (see the case study on driverless cars and ride sharing on pages 28 to 29).

To stay relevant, Infrastructure Victoria’s 30-year strategy will be updated every three to five years. As circumstances change, so will our advice.
Technology case study

**EMERGING VEHICLE TECHNOLOGIES**

Even when we know the nature of an emerging technology, the implications of its use may not be immediately clear.

There is a range of emerging vehicle technologies that could fundamentally affect the way people use Victoria’s transport networks. In particular, driverless vehicles and ride sharing are two interrelated technologies that may change the way people get around.

Driverless vehicles could offer an opportunity for more efficient and safer roads, while ride sharing could provide more flexible transport options. In combination, they could enable people to avoid the major cost of owning their own vehicle, while having the convenience of an automatic transport option to take them from point A to point B.

Australia is a small market on a global scale. It is largely a technology taker, and while there are great opportunities for local advances in technology, Victorian consumers will demand what they see working in other parts of the world.

Government may not be able to (or want to) control the nature of how technology options are taken up. But in planning for the future, we must be cognisant of what new technologies might mean in the Victorian context, how they can contribute to better outcomes and what challenges they might present.

There are still a lot of unknowns about what these technologies might mean for Victoria (see figure 1), but this is not cause for inaction.
When? Gradual adoption or big bang?

Equity considerations during transition?

More efficient use of road network?
  Road design implications?

‘Empty’ movements of vehicles returning home without passengers?

‘Empty’ movements of vehicles circulating waiting for passengers?

Reduce need for parking spaces, freeing up land for better uses?

More/lengthier trips by vehicles?
  Knock-on implications for congestion?

Competition with public transport and other non-car modes?

Improved mobility for people who can’t drive due to age or disability?

Role in delivery of goods?

Regulations/road rules implications?

People and firms change their location? Urban expansion or urban consolidation?

Figure 1: There are still many unknowns in relation to known emerging transport technologies
OBJECTIVES AND NEEDS

Photo title: Docklands by Peter Glenane
Objectives

Objectives articulate what the strategy is aiming to achieve. They also provide a framework for identifying and prioritising infrastructure needs.

The objectives proposed by Infrastructure Victoria draw on analysis of the current and possible future state of Victoria’s society, economy and environment. The draft objectives are intended to be specific enough to be meaningful, while providing enough scope to capture a broad range of infrastructure needs. They are not presented in order of importance and are numbered only to help facilitate consultation. Read together, however, the objectives do tell a story about where Victoria is now, where the state is headed in future and where we might want it to be.

Unlike objectives set out in some other jurisdictions’ infrastructure strategies (eg NSW and the UK), Infrastructure Victoria has not framed the draft objectives around specific sectors (transport, water, health, etc). Instead, the draft objectives cross sectoral lines and aim to improve social, economic and environmental outcomes in a range of areas.

Infrastructure Victoria considered grouping the draft objectives under the themes of society, economy and environment, but decided not to because they relate to all three in one way or another. For example, population growth represents a major societal change, but it also drives economic growth and can threaten the natural environment. Lifting productivity has clear economic benefits, but could also help address disadvantage and improve environmental sustainability. Similarly, climate change has clear environmental and social impacts, but adapting to a lower carbon future also presents opportunities and challenges for the economy.

MEASURABLE OBJECTIVES

Under each draft objective we have included possible indicators to show where Victoria is headed. In most cases, infrastructure will be one among many factors that influence these indicators, but the indicators at least provide some sense of how Victoria’s society, economy and environment interact and change over time. This will be particularly important when the strategy is refreshed in three to five years’ time, as it will help determine whether and how the strategy’s focus might shift. The indicators will also be useful when undertaking triple bottom line assessments of options to meet needs in the next phase of work.

The indicators draw on established national, state and local community statistics. In some cases, it will be possible to analyse indicators in greater depth (eg by gender, age and location, including metropolitan vs regional). We expect they will be refined as the strategy develops.
Needs

Infrastructure needs are the challenges and opportunities that must be addressed to achieve our objectives. Needs also provide the framework for developing options in the next phase of work.

The draft needs identified by Infrastructure Victoria have been informed by analysis of the current and projected performance of Victoria’s infrastructure, both existing (e.g., the Westgate Bridge) and planned (e.g., Melbourne Metro). This analysis also considered assets the Victorian Government does not own.

Some of the draft needs relate to issues that affect a particular location in Victoria, while others affect a particular sector. For the most part, however, the needs relate to emerging challenges and opportunities that cross spatial and sectoral boundaries. In many cases, the needs relate to multiple objectives.

All the needs identified are related to infrastructure in some way, but will not necessarily be solved with infrastructure. For example, when considering options to meet needs, we may find that policy, pricing or regulatory reforms are more effective than building new things. Needs have been framed broadly to make sure we don’t overlook sensible reforms.

In articulating needs in this paper, we have not discussed potential solutions. Too often in infrastructure planning, projects are proposed without rigorous identification or assessment of the overarching objective and need being addressed. Infrastructure Victoria intends to work from the ground up. Once objectives and needs are confirmed, we will turn our attention to options before making final recommendations to government by the end of 2016.

All technical reports underpinning the objectives and needs, including reports on the current and future state of Victoria and sectoral infrastructure capability assessments, will be available at yoursay.infrastructurevictoria.com.au.
Hard decisions will need to be made

One of the biggest challenges we face is that it will be impossible to achieve everything and address every issue. Hard decisions will need to be made along the way. Reading through the pages that follow, you will see that Infrastructure Victoria has already started this process in framing the draft objectives and needs.

We need your help to improve the draft objectives and prioritise the draft needs, and to identify anything we might have missed. Consultations provide an opportunity for community and stakeholder views to be heard.

The final set of objectives and needs will be confirmed once consultations close and all of the feedback has been considered. These will then form the basis of the options paper, which will be released in the second quarter of 2016.

QUESTIONS TO GUIDE CONSULTATION

Hearing from you
- What is most important to you in planning Victoria's infrastructure for the next 30 years?

Improving the objectives
- How could the objectives be improved?
- Should any objectives be added, removed or combined?

Prioritising the infrastructure needs
- How could the infrastructure needs be improved and, in particular, what needs don’t appear that you would like to see included?
- What needs are most important and least important to you? Think top and bottom three.

Drawing on evidence
- Can you think of any examples to illustrate your points?
- What evidence might support your views or help improve the strategy?
## Summary of draft objectives and needs

<table>
<thead>
<tr>
<th>DRAFT OBJECTIVES</th>
<th>DRAFT NEEDS</th>
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| **1**Respond to population growth and change | A. Address infrastructure deficits in high-growth areas  
B. Manage increasing demands on health infrastructure  
C. Provide access to high-quality school facilities |
| **2**Support healthy, safe and vibrant communities | A. Enable physical activity through infrastructure and urban design  
B. Provide good public spaces where communities can come together  
C. Strengthen access to cultural infrastructure  
D. Maximise positive impacts on amenity and wellbeing from infrastructure |
| **3**Reduce disadvantage | A. Improve accessibility for people with disabilities and/or mobility challenges through infrastructure  
B. Address housing affordability challenges with better social housing  
C. Support changing approaches to social service and justice delivery through infrastructure |
| **4**Enable workforce participation | A. Provide access to the diversity of employment opportunities offered by the central city  
B. Provide better links to non-central city employment centres  
C. Improve access to early childhood care facilities |
| **5**Lift Victoria’s productivity | A. Improve the efficiency of freight supply chains through infrastructure  
B. Move people to and from airports more efficiently |
| **6**Support Victoria’s changing, globally integrated economy | A. Boost tourism through infrastructure provision  
B. Enable the growth of a highly skilled, digitally connected workforce through infrastructure |
| **7**Promote sustainable production and consumption | A. Improve rural and regional water security  
B. Manage pressures on landfill and waste recovery facilities |
| **8**Protect and enhance natural environments | A. Help preserve natural environments and minimise biodiversity loss through infrastructure  
B. Improve the health of waterways through infrastructure |
| **9**Support climate change mitigation and adaptation | A. Smooth the adjustment to a carbon-constrained world through infrastructure  
B. Adapt infrastructure to changing climate conditions |
| **10**Build resilience to shocks | A. Improve the resilience of critical infrastructure to disruptive events  
B. Address infrastructure-related emergency response challenges |
The demographic story in Victoria is essentially one of growth. Victoria currently has an estimated resident population of around 6.1 million people. This is expected to grow to around 6.6 million in five years, 7.7 million in 15 years and 9.4 million in 30 years, largely driven by overseas migration and natural increase (births minus deaths) (see figure 2). Every age group will grow significantly in absolute terms, as will the number of households.

The population will not just grow, however; it will also change. Population ageing, seen in many developed countries, will also affect Victoria. The proportion of older Victorians (65+) will grow from approximately 15 per cent of the population in 2016 to approximately 21 per cent in 2046, while the proportion of people of prime working age (15–64) will decline from approximately 66 per cent to 62 per cent over the same period (see figure 3). Household composition is expected to change, with proportionally more households likely to be made up of singles or couples without children. The distribution of population growth will not be spread evenly. In line with the global trend towards urbanisation, many parts of Melbourne and some regional centres are expected to grow strongly, while the population in other areas, particularly in rural Victoria, is likely to decline.

These demographic shifts will place significant demands on Victoria’s infrastructure. Schools, for example, will have to accommodate an additional 421,000 young people (5–17) by 2046. The rising proportion of older Victorians will place immense pressure on health infrastructure (as people consume more health services with age) and change demands on transport infrastructure. Concurrently, the declining proportion of working age people will impact government’s ability to raise the revenue required to fund infrastructure (discussed further in objectives 4 and 5). New arrivals to Victoria will have different infrastructure needs to those who have left, while housing development will require new or upgraded infrastructure across all sectors.

**Infrastructure Victoria’s considerations**

Objectives 1 and 2 were originally combined under the title ‘Maintain Victoria’s liveability’. This was partly inspired by Melbourne’s leading position on The Economist liveability rankings, and the recognition that it could be difficult to maintain this position as densities increase. Liveability is a very promising area of research, but it tends to be quite broad, variously defined and urban focused. In the end, we decided to frame this objective around one of the critical factors that will have a major impact on infrastructure planning across the state, namely population growth and change. We’re keen to hear if this objective makes sense to you and how it could be improved.
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Access to health care (GPs, clinics, hospitals) and education (early childhood, schools, VET)
- Population size, densities (distributions), gender and age profiles
- Housing supply and affordability

Note: Infrastructure is one of many contributing factors to these indicators.
DRAFT NEEDS 1
Respond to population growth and change

Need A: Address infrastructure deficits in high-growth areas

Many areas in Melbourne, particularly where housing is more affordable and population growing strongly, are less well serviced by infrastructure. In recent years, both a Parliamentary Inquiry and Victorian Auditor-General report found that there is a significant infrastructure backlog in growth and peri-urban communities. As government cannot provide the same level of infrastructure to all locations in the state, more innovative approaches are required. This includes understanding the role of the planning system in facilitating this growth.

If the state continues to accommodate more people in these areas over the next 30 years, there will be greater demand for new infrastructure such as schools and extending public transport networks. The Plan Melbourne refresh discussion paper canvasses a shift to accommodate more dwellings in established areas (70 per cent of the total required), greater than current projections. This could have significant implications for infrastructure by leveraging existing services and reducing pressure on government finances.

Secondary objective:
Support safe, healthy and vibrant communities

Need B: Manage increasing demands on health infrastructure

Victoria’s demographic shifts are experienced in different places in different ways. Some regional areas are experiencing a rise in the number of people aged over 65, while some areas across Melbourne are experiencing a mini baby boom. Victoria’s health infrastructure (such as hospitals) needs to respond to these different demands over the next 30 years. Factors that need to be considered for an elderly population cohort are the increasing prevalence of lifestyle and chronic diseases associated with longer lifespans, as well as the preference to ‘age in place’ (at home). Conversely, a younger population cohort is likely to place increasing demands on women’s and children’s hospitals and on maternal and child health services.

These demographic changes are expected to place greater pressure on health infrastructure and expenditure. Commonwealth expenditure is predicted to rise from 4.1 per cent to 7.0 per cent as a share of national GDP by 2059–60. At a state and territory government level, this will be reflected in an increase from 2.4 per cent to 3.8 per cent of GDP during this time. Adaptability of infrastructure will be important, as will integrated thinking between technology, health services and buildings.

Secondary objective:
Support healthy, safe and vibrant communities
Need C: Provide access to high-quality school facilities

Demand for new schools is predominantly driven by population growth. This is particularly acute in the growth areas with the Victorian Government identifying a need for over 50 new schools in the next five to six years across the government and non-government school sectors. While independent and Catholic schools may relieve some of the pressure, there will still be significant pressure on government to meet this demand. More generally, population growth as a whole is expected to be a major driver of asset investment in the education sector for at least the next 15–20 years. This demand challenge, however, is not evenly spread.

A decline in enrolments and oversupply in some areas have led to spare capacity, particularly in regional areas. There are also major shifts underway – digital technology is increasingly incorporated into the classroom. Victorians will also likely see a shift over the next 30 years towards lifelong learning and tailored curriculums (through data analytics) being driven by a global education marketplace.

Secondary objective: Reduce disadvantage

ALTERNATIVE NEEDS

An alternative need to plan for the demands of new arrivals on infrastructure was considered, but given the diverse nature of this cohort, it was difficult to determine specific infrastructure needs. Infrastructure Victoria concluded that a sufficient majority of their needs are captured in broader infrastructure provision for Victoria.

An alternative need to integrate the delivery of health and social services through infrastructure was considered. This need focused on people, particularly the elderly, being able to access a range of health and social services in a more efficient way. There is evidence that innovation will be needed to optimise health and social service delivery and asset utilisation. However, there is not enough evidence to say that a system-wide approach was applicable in all cases. Some of the evidence for this need was absorbed into the manage increasing demands on health infrastructure and support changing approaches to social service and justice delivery through infrastructure needs.

An alternative need to better integrate infrastructure requirements into planning decisions was considered. While the integration of planning and infrastructure is a very important consideration, it is not something that can be done in isolation, as it is relevant for all infrastructure decisions. We will consider opportunities and propose possible solutions for integrated infrastructure planning throughout the strategy’s development and not just for needs that relate to demographic shifts.

Are these needs more pressing than the ones we have proposed?
Responding to growth challenges is critically important for maintaining the state’s reputation as a great place to live, but securing the wellbeing of Victorians also means satisfying the need for health, safety and social connection.

Health and wellbeing indicators in Victoria show a complex story. Life expectancies at birth have been increasing steadily and will most likely continue to do so. A boy born in Victoria in 2046 is expected to live to around 87 years, a girl to 89.5 years. Victorians’ self-reported health has also been improving; at last count, approximately 84 per cent of Victorians surveyed by the Department of Health rated their health as good, very good or excellent. However, the incidence of chronic diseases like cardiovascular disease and type 2 diabetes, along with associated risk factors like obesity and physical inactivity, are on the rise (see figure 4), and around one in five Victorians have a mental health condition.

Only a very small proportion of Victorians report being victims of crime, but this does not necessarily correlate with perceptions of safety. VicHealth reports that while almost all the Victorians it surveyed reported feeling safe walking around their local communities during the day, only seven in 10 felt safe at night, with this number dropping to around five in 10 for females.

On the whole, according to VicHealth, Victorians report relatively high levels of subjective wellbeing, particularly those living in peri-urban and regional areas. Many Victorians participate in their communities through volunteering, taking part in sport or recreational activities and attending cultural and leisure venues and events. The vast majority of Victorians surveyed by the ABS felt they were able to get support in a time of crisis from people outside their household and most believed it’s a good thing for society to be comprised of different cultures.

Whether it be providing sporting facilities and green spaces where people can exercise and connect with each other and with nature, delivering community-based health care or improving transport and justice services, infrastructure plays a major role in shaping Victorian communities.

**Making our state a great place to live is about more than just accommodating growth.**

It is also about Victorians being and feeling healthy, safe and part of the community.

All of these factors can be influenced by the quality, design and accessibility of infrastructure and services.

**DRAFT OBJECTIVE 2**

Support healthy, safe and vibrant communities

**Infrastructure Victoria’s considerations**

It was difficult to define this objective because the experience of wellbeing is very personal at the individual level and very complex at the community level. Nonetheless, we have tried to assemble some relevant indicators and evidence to show how Victorian communities are tracking. The themes of security and belonging captured in this objective are also loosely based on Maslow’s hierarchy of needs. This hierarchy places basic survival needs like food, water and shelter at the bottom of the pyramid and the desire to fulfil one’s own potential at the top, with safety, belonging and esteem (or respect) in between. Let us know if you think we’ve got this objective right or missed some critical aspect.
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Life expectancy, obesity, rates of chronic disease, self-reported physical and mental health
- Feelings of safety, assault and property damage rates, road traffic injuries
- Participation in sporting and recreation activities and involvement in social/community groups
- Cultural diversity – proficiency in spoken English, Aboriginal population, country of birth, attitudes

Note: Infrastructure is one of many contributing factors to these indicators
DRAFT NEEDS 2
Support healthy, safe and vibrant communities

Need A: Enable physical activity through infrastructure and urban design

Obesity and physical inactivity play a significant role in the incidence of chronic disease in Victoria. Unaddressed, these risk factors will pose a significant drain on Victoria’s health system over the next 30 years along with the other costs associated with poorer productivity and wellbeing.

Infrastructure is one way to encourage greater levels of activity and participation. This includes cycling paths, sporting facilities and open spaces for walking and exercise. Community design can also play an important role, in part through proximity of housing to services. A particular challenge is the health and wellbeing of Victorian children. Some key indicators show that children are walking to school less and being driven more. In 2013, approximately half of all Victorian children aged 5–12 were always driven to school. Only one in four children in school years 5, 8 and 11 met the recommended amount of physical activity on all days of the week, with children in rural areas more likely to meet guidelines than children in metropolitan areas.

Secondary objective:
Respond to population growth and change

Need B: Provide good public spaces where communities can come together

With many people living in, or moving to, denser, inner Melbourne suburbs, quality public spaces have been recognised as central to the wellbeing of communities. However, as Victoria’s population grows over the next 30 years, access to these spaces will come under pressure. In particular, generally across Melbourne available open spaces like parks are shrinking with population growth. In contrast, many local councils report a backlog of maintenance for civic assets in their annual reporting.

Public spaces are important for a number of reasons such as fostering social cohesion (understood as willingness of people to socialise and engage around common interests). These spaces also provide opportunity to exercise or participate in sports or recreational activities, while providing environmental benefits such as supporting biodiversity. For these reasons it is appropriate to consider it public infrastructure. The level of social cohesion varies across Victoria – as a proxy, the percentage of the (adult) population that participated in citizen engagement activities was 47.5 per cent in metropolitan Melbourne compared to 58.9 per cent in regional areas.

Secondary objective:
Protect and enhance natural environments
Need C: Strengthen access to cultural infrastructure

Access to museums, galleries and other cultural infrastructure is an important part of the success of Victoria, and particularly Melbourne’s much-valued liveability. Victoria has a diverse offering of major events throughout the year, with Melbourne recognised as the cultural capital of Australia.

Victoria’s regional cities have developed rich cultural offerings, with Bendigo Art Gallery one of the standouts. While individual assets may not be considered large, when viewed as a network their coverage is significant. There is also a broad range of cultural facilities that supports local communities – including the performing arts. The location of these facilities and the level of engagement with the community and visitors are important considerations.

Access to arts, other cultural facilities and major events plays an important role in contributing to a sense of community, as well as stimulating tourism. The state’s cultural venues represent a significant tourism asset, with 10 million visitors attending Victoria’s state-owned arts and culture institutions in 2014. These facilities and associated events can foster creativeness, which is a key enabler in transitioning to a services-based economy.

Secondary objective:
Support Victoria’s changing, globally integrated economy

Need D: Maximise positive impacts on amenity and wellbeing from infrastructure

Ultimately a growing population results in higher levels of activity in and around our communities. This can mean greater economic activity, access to services and vibrancy, but it can also result in less desirable impacts, in part from the development and operation of infrastructure. For example, a growing freight task can disproportionately impact residents close to ports. These impacts also manifest as developments move closer to, or are encroached upon by, infrastructure such as landfill facilities. Also infrastructure that can support farmers’ ability to operate, particularly in peri-urban and growth areas, may also be relevant.

Examples include noise or air pollution, which can have health implications. Infrastructure such as environmental monitoring equipment can play a key role in understanding the intensity and severity of these impacts on the community and the environment.

Secondary objective:
Reduce disadvantage

ALTERNATIVE NEEDS

An alternative need to improve the condition, capacity and quality of community infrastructure was considered, but the evidence for this problem is unclear. It is not always the case, for example, that a poorly maintained facility is undermining community wellbeing – it may be that the facility in question is redundant. Accordingly, the range of challenges relating to community amenities is better considered under the need to provide good public spaces where communities can come together.

An alternative need to increase availability of underutilised infrastructure for community use was considered, but this will be an important consideration in the strategy across a number of areas considering restricted space, funding and some specific asset classes.

An alternative need to shift investment from major sporting and cultural facilities to local community facilities was considered. Despite some evidence of challenges for investment in local facilities, there are different objectives in play for each investment type. It does not make sense, therefore, to make this an either/or proposition.

Are these needs more pressing than the ones we have proposed?
People who face socio-economic and other forms of disadvantage may have less ability to participate in society and access resources.

In Victoria, disadvantage is concentrated in certain areas and experienced most acutely by certain cohorts.

Infrastructure can help provide better access to employment and educational opportunities and social services and activities for disadvantaged Victorians.

To make Victoria a great place to live for all, we need to recognise that not everyone benefits equally from the state’s offerings. According to the ABS, for example, approximately 14 per cent of surveyed Victorians had experienced homelessness at some point in their lives.

Disadvantage tends to be concentrated in particular areas. At an aggregate level, the ABS’s Socio-Economic Indexes for Areas (SEIFA) data shows higher levels of disadvantage in the west and north-west of Melbourne and much of regional Victoria (see figure 5). At the smaller area level, SEIFA data shows significant variations between suburbs and towns. Locational disadvantage has been linked to poor outcomes across a range of indicators, from unemployment to educational attainment, and from health conditions to prison admissions. This means that disadvantage is often compounded by where you live.

Some groups, such as Aboriginal people, migrants and refugees, people with a disability, aged people and single parent families experience particularly high levels of disadvantage. A recent report by Aboriginal Affairs Victoria shows that although progress has been made on closing the gap between Aboriginal and non-Aboriginal people on some indicators, on many others it has stayed the same or got worse. For example, over-representation of Aboriginal adults in the Victorian justice system is increasing.

Infrastructure, or a lack thereof, can play a role in either easing or exacerbating disadvantage. Infrastructure can help safeguard basic amenities like a clean environment, as well as provide access to employment and education opportunities, and additional social supports.

**Infrastructure Victoria’s considerations**

Disadvantage is one of those ‘wicked problems’, referred to thus because its causes and potential solutions are as numerous as they are complex. Infrastructure can’t reduce disadvantage by itself, and it may be impossible to isolate infrastructure’s contribution to this objective. However, we know that Victoria’s liveability (however that’s defined) is not distributed evenly across the state and infrastructure is part of that story. Tell us if you think reducing disadvantage is a worthwhile objective for this strategy to pursue.
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Index of Relative Socio-Economic Disadvantage
- Homelessness rate
- Early childhood development – percentage ‘on track’ vs ‘vulnerable’
- Literacy and numeracy standards and education attainment rates
- Health indicators by cohort

Note: Infrastructure is one of many contributing factors to these indicators
DRAFT NEEDS 3
Reduce disadvantage

Need A: Improve accessibility for people with disabilities and/or mobility challenges through infrastructure

Some members of the community experience challenges gaining access to important services, including those who use mobility, hearing or vision aids. This is often a challenge of legacy infrastructure, where such requirements were overlooked leaving a long trail of retrofitting, and associated costs. In particular, much of the public transport network does not yet meet Commonwealth Disability Discrimination Act 1992 requirements.

However, with new forms of service delivery occurring already, including through ICT, there are broader ways to facilitate greater access to key services. There is also a need to enable access to other activities that results in greater social connections and recreational opportunities. This applies to the broader wellbeing of Victorians, particularly ageing cohorts who may be retired but still have much to offer the community. As the population ages over the next 30 years, this need will become more pressing.

Secondary objective:
Enable workforce participation

Need B: Address housing affordability challenges with better social housing

Melbourne’s rising house prices and rents present a significant challenge to the housing market over the next 30 years. The proportion of low-income households in the private rental market paying more than 50 per cent of their income for rent increased from 29 per cent in 1996 to almost 39 per cent in 2011. Less than 9 per cent of rental properties in metropolitan Melbourne are affordable to low-income households, and these are predominantly in outer suburbs.

The lack of affordable housing in the private rental market is resulting in increasing distances between low-income households and employment. Established areas that are closer to jobs are not accommodating population growth to the same extent as Melbourne’s outer growth corridors. These factors in part have led to an increase in the number of people seeking alternatives to the private market, including public and community housing and government-subsidised housing assistance. However, the increasing demand from low-income households is unlikely to result in new supply, as the income those households offer is insufficient to stimulate a private market response.
Further, rising rental costs also prevent existing tenants of social and community housing from moving back into the private rental market if their circumstances improve and they no longer require high-subsidy social housing.

The performance of public housing assets as an important component of affordable housing has also been called into question. In 2012, the Victorian Auditor-General considered that some properties were nearing obsolescence and that there was pressure on the waiting and transfer lists in response to demand.

**Secondary objective:**
Support healthy, safe and vibrant communities

**Need C: Support changing approaches to social service and justice delivery through infrastructure**

There are a number of important social and justice services provided by government. The assets that support these services are varied, from over-the-counter service centres to specialist facilities. These assets can suffer from problems such as poor condition, poor functional fit and sub-optimal location.

The tendency to rely upon fixed assets has meant that services are unable to adapt to changing community needs. For example, there is growing complexity in the crimes police need to respond to, and a growing expectation about how rapid this response will be. In particular, there is an increasing focus on non-street crimes, such as family violence. This challenges existing approaches and changes the way police are expected to engage with the community.

Improving social service and justice delivery must not be constrained by the existing asset base or delivery approach. Developments in technology are also likely to make connections between government and citizens more targeted and efficient, which could render current services and their related assets redundant.

**Secondary objective:**
Support healthy, safe and vibrant communities

**ALTERNATIVE NEEDS**

An alternative need to improve transport to jobs and services in regional centres was considered. While there is evidence of a link between a lack of transport options and disadvantage, it was not clear that calling this out separately to other needs was useful. Better transport options could be part of the solution to enabling better social service and justice delivery, for example.

An alternative need to emphasise infrastructure provision to support Victoria’s Aboriginal communities was considered. However, infrastructure is unlikely to be the key driver to address Aboriginal disadvantage.

An alternative need to target infrastructure investments to help areas with acute and/or entrenched socio-economic disadvantage was considered. However, the causal link between the provision of infrastructure and the level of disadvantage in particular locations is not easily understood. As part of this alternative need, we considered whether the lowest SEIFA ranking would be useful. However, it was not seen appropriate to identify locations to target using this ranking system as they may not correspond with the areas where evidence of infrastructure need exists.

Are these needs more pressing than the ones we have proposed?
Participation in the workforce benefits both individuals and the wider economy. Over the coming decades Victoria’s workforce participation rate is expected to decline, largely due to the ageing of the population. It is unlikely this decline can be reversed entirely, but infrastructure can play a role in connecting people to jobs and supporting a healthy, educated workforce.

Workforce participation is one of the three key drivers of economic growth, along with population and productivity growth. Participation in the workforce also improves social inclusion, which has been shown to have many benefits for individuals including improved mental and physical health. These benefits flow to society in many ways, including reduced dependence on government services and a more engaged community.

Victoria has benefited from a significant increase in the participation rate since the early 1990s due to favourable demographics and increasing participation of female and older workers in the workforce. However, the favourable demographics are currently reversing and workforce participation is expected to decline in the future due to the ageing population. While Victoria faces an ageing population challenge, this will be partly moderated by rising participation rates in older age groups as people increasingly work for longer and more flexibility.

In addition to policies that encourage people to enter and remain in the workforce, infrastructure can assist Victoria to mitigate the effects of an ageing population on workforce participation. Infrastructure can help connect people to jobs, either physically (see figure 6) or digitally. It can also enable the delivery of services that help people obtain appropriate skills for the changing needs of the economy and keep people healthy for longer so they can continue to participate in employment.

Infrastructure Victoria’s considerations

Given that participation and productivity are two of the ‘three Ps’ of economic growth (the other being population), we thought about combining objectives 4 and 5. In the end, we decided the concepts were sufficiently different to warrant two separate objectives. Many of the needs identified could, however, support the achievement of both objectives (and objective 6 for that matter), so we’re keen to hear your thoughts.
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Employment-to-population ratio
- Unemployment and under-employment rates
- Proportion of people aged 25–64 years with a vocational or higher education qualification
- Access to education and jobs

Note: Infrastructure is one of many contributing factors to these indicators.
DRAFT NEEDS 4
Enable workforce participation

Need A: Provide access to the diversity of employment opportunities offered by the central city

Victoria’s high productivity industries are typically knowledge-intensive sectors such as professional, financial and educational services. These industries are particularly concentrated in the central city for the benefits of drawing on deep labour pools. The continued attractiveness for knowledge-intensive sectors to locate in Melbourne will in part be driven by increasing access to skilled workers.

It is anticipated that the transport system will need to provide for growing demand for central city travel from all parts of Melbourne, with capacity constraints being pronounced in Melbourne’s west and north growth areas. The number of jobs in Melbourne’s west and north has not kept pace with the number of residents. Accordingly, people travel outside of these areas for work, often to the central city, and this is expected to increase with population growth. In particular, the rapid expansion of the west has put pressure on existing transport infrastructure, which is exacerbated by more workers in these areas accessing the central city for employment. In contrast, the growth areas in the south-east of Melbourne are less reliant on the central city for job opportunities given their proximity to other employment centres including Dandenong and Monash.

Under a range of population and employment scenarios the transport system will not meet the demand for these trips to and from the central city into the future. Transport and planning initiatives such as Melbourne Metro and the emerging East Werribee employment cluster are important, but will not address this need completely, and certainly not without other initiatives (including ICT to support greater work flexibility and efficiency improvements to the transport network) over the next 30 years.

Access between Melbourne’s central city and major regional centres (particularly Ballarat, Bendigo and Geelong) is also important in enabling greater workforce participation and lifting productivity.

Secondary objective:
Lift Victoria’s productivity
**Need B: Provide better links to non-central city employment centres**

Melbourne’s transport system has developed to emphasise movements into the central city. While the central city is a significant source of economic activity, other metropolitan employment centres are also critical to the Victorian economy. Plan Melbourne identified five non-central city employment clusters in Monash, Dandenong South, Sunshine, East Werribee and Latrobe. Melbourne Airport (and the surrounding commercial and industrial activities) is also a significant employment centre. Monash has the largest concentration of metropolitan employment outside the central city with close to 80,000 jobs, which is expected to increase to 145,000 in 30 years.

As recognised by Plan Melbourne, the transport system, and in particular public transport, will need to provide for growing employment in these centres. However, the legacy of a radial transport system compromises access to these employment centres compared to the central city. While some contemporary transport projects, including EastLink, and the roll-out of SmartBus, have gone some way to accommodate journeys to these centres from residential areas, these initiatives do not address this need completely, and certainly not without other initiatives over the next 30 years.

**Secondary objective:**
Lift Victoria’s productivity

**Need C: Improve access to early childhood care facilities**

A barrier to workforce participation exists where early childhood facilities are not available to parents and carers wishing to return to work. These facilities span long day-care, family day-care and kindergarten services through to outside school hours care (OSHC) offered by primary schools or outsourced (eg Camp Australia). There is currently high demand across the state for early childhood services, with the sector more or less at capacity at all times and many assets being over-utilised. Once children reach primary school, this demand does not abate as parents rely upon OSHC to cover an eight-hour working day.

Some of the barriers to supply of facilities and services in specific locations across Victoria could include regulatory restrictions (such as those that flow through the planning system) and confusion across three tiers of government. The provision of these facilities and services is also complicated by the disparate nature of early childhood education, which operates under a variety of ownership models, including private, community and local government. However, infrastructure may play a part through sub-optimal use of the facility (eg not providing long-day care at sessional kindergartens).

**Secondary objective:**
Reduce disadvantage

**ALTERNATIVE NEEDS**

An alternative need to improve the infrastructure connections within and between regional centres was considered. However, evidence shows that a more pronounced pressure point for regional cities (Ballarat, Bendigo and Geelong) is their connection to Melbourne, particularly for workforce participation. This is considered in the need to provide access to the diversity of employment opportunities offered by the central city.

Likewise, a need to improve transport infrastructure to support business and community central city access was considered, but it does not consider the role of other sectors in addressing this challenge. Central city access has remained an important theme under this objective.

A range of needs around providing access to jobs by active transport was also considered. There is evidence that walking and cycling can provide an important role in meeting demand for shorter journey to work trips. However, given the broader benefits for health that walking and cycling can bring, this will be considered in the need to enable physical activity through infrastructure and urban design under draft objective 2. Walking and cycling are also relevant to some of the broader needs as well.

Are these needs more pressing than the ones we have proposed?
Productivity growth is critical to improving living standards in the long term, particularly in the context of declining workforce participation.

Productivity growth in Victoria has been relatively subdued since the turn of the century.

Infrastructure can make a major contribution to lifting Victoria’s productivity by enabling more efficient business activity, supporting innovation and skills development, and promoting workforce health and wellbeing.

Productivity is the key to improving people’s living standards. Increasing productivity increases the amount of income people have for an amount of hours worked or increases the amount of discretionary time a person has for the same amount of income.

Declining workforce participation due to changing demographics will provide significant economic challenges for Victoria in the future, as the proportion of the population working is projected to decline. Productivity growth is key to ensuring that Victoria can address these challenges and continue to remain internationally competitive and improve living standards.

During the 1990s Victoria had very strong productivity growth, which can be predominantly attributed to the microeconomic reforms of the 1980s and 1990s. During this time labour productivity growth averaged 2.6 per cent a year, almost 0.5 percentage points a year greater than Australia as a whole. However, since the turn of the century, Victoria’s productivity growth has almost halved and has been growing much less than Australia as a whole (see figure 7). This presents a challenge for Victorians to maintain living standards and increase economic growth in the future.

The provision and use of infrastructure impacts how and when businesses and people interact, while also providing the essential services that enable them to attend to their daily tasks and needs. Given the integral nature of infrastructure in our economy and daily lives, improving the productivity of Victoria’s infrastructure in the face of a move towards a more service-based economy is crucial to improving the state’s overall productivity growth.

Technology, in particular, has huge transformative potential. Greater adoption of new and emerging digital technologies could result in significant productivity gains in many industries.

**Infrastructure Victoria’s considerations**

Productivity is something economists talk about a lot, but it may not mean that much to everyday Victorians. It’s basically about getting more from what you put in, and economists think it’s the key to improving material wellbeing in the long term. We think it’s a very important objective for an infrastructure strategy. What do you think?
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Level of productivity
- Productivity growth
- Business innovation

Note: Infrastructure is one of many contributing factors to these indicators.
DRAFT NEEDS 5
Lift Victoria’s productivity

Need A: Improve the efficiency of freight supply chains through infrastructure

As the Victorian economy grows, trade is expected to increase as will the number of goods that need to be moved around the state. Freight volumes across Victoria are expected to increase markedly over the next 30 years; however, a number of factors may influence the level of demand, such as a consumer shift from goods to services. Reducing the cost of freight handling, storage and transport or improving reliability of supply chains will increase productivity in the coming years. For example, as nearly all of this freight is moved on roads, efficiency benefits are expected from the commitment to improved access to the Port of Melbourne. Business is also looking to technology as a key driver of supply chain efficiency.

The Port of Melbourne and the regional commercial ports are gateways for freight catchments extending throughout metropolitan Melbourne, regional Victoria and well into southern NSW, SA and Tasmania. In addition, airfreight is playing an increasing role in facilitating Victoria’s trade, particularly for high-value, time-sensitive commodities (such as fresh produce bound for growing Asian markets). Victoria’s ports have sufficient capacity to meet forecast demand for some time to come and by world standards are operating efficiently. However, it is important that additional port capacity is available when required in future, particularly for key trades such as containerised imports and exports, bulk liquid imports and regional exports. In the longer term, as the Port of Melbourne meets its maximum capacity, a second container port may be needed. Opportunities to expand existing or establish new facilities are limited, so careful planning is needed with long lead times. Constraining capacity at key gateways would have significant adverse impacts with both direct and indirect effects on the economy.

Secondary objective:
Support Victoria’s changing, globally integrated economy
Need B: Move people to and from airports more efficiently

Victoria’s airports are a significant aspect of the tourism sector and also play an important role supporting our globally integrated, knowledge-based economy. In addition, they operate as significant logistic and employment centres.

Melbourne’s Tullamarine Airport is Australia’s largest curfew-free major international airport, and is the second busiest airport by passenger numbers in Australia. By 2033, Melbourne Airport projects passenger numbers to double, with a significant number of these travelling for business rather than leisure. Avalon Airport, strategically located close to the M1 (Princes Highway), rail and sea, plays an important role as Melbourne’s second airport, providing good access from Melbourne’s west as well as Geelong. Avalon is not constrained airside or landside.

To compete globally and remain attractive for international investment, efficient movement of people to and through these spaces is imperative. For example, access to Tullamarine Airport is heavily reliant on the CityLink-Tullamarine corridor, which is one of the most heavily used in Melbourne, carrying 210,000 vehicles a day in its busiest section – a number forecast to rise to 235,000 by 2031. The capacity of this road impacts the provision of services by SkyBus and taxis. Access to Tullamarine Airport will benefit from the CityLink-Tulla Widening; however, this project does not address access issues facing our gateways completely, and is not sufficient to support growth over the next 30 years.

Secondary objective:
Support Victoria’s changing, globally integrated economy

ALTERNATIVE NEEDS

An alternative need to improve ICT infrastructure to help strengthen the links between regional, domestic and international economies was considered, but there was no clear evidence that this was an infrastructure-led problem. Where the market is not providing ICT to meet needs, there are programs for addressing blackspots in regional areas.

An alternative need to improve the efficiency of agricultural supply chains through infrastructure was considered. However, a major driver of improvements to the agricultural supply chain is improvements to the transport system. Evidence suggests that the needs of the sector can be addressed in needs relating to the wider supply chain.

An alternative need to support student access to the full breadth of the school curriculum was considered, but the link to infrastructure was unclear. A more targeted need to provide access to high-quality school facilities is discussed under draft objective 1.

Are these needs more pressing than the ones we have proposed?
Victoria’s economy has been undergoing significant structural change over the last 25 years, moving from an industrial economy based on manufacturing to a knowledge economy focused on delivering services. Over this time, manufacturing’s contribution to Victoria’s Gross State Product has fallen from 15.2 per cent to 8.2 percent, while financial and insurance services has risen from 7.0 per cent to 11.4 per cent.

Even with the growth in high-value manufacturing, this transition is expected to continue into the future, exacerbated by the decline in the automotive manufacturing sector and continued growth in knowledge-based industries such as health, education and finance.

Infrastructure Victoria’s considerations

We considered splitting this objective into two as it responds to two different, though related, trends affecting Victoria’s economy: the rise of service/knowledge-based industries and the rise of Asia as an economic powerhouse. We also weren’t sure if it should be included as an objective at all, as many of its associated needs could sit under objectives 4 or 5. Do you have an opinion?
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Industry/sector contributions to Gross State Product and employment
- Tourism gross value added
- International trade rate
- International short-term movements for education, business and conferences per capita

Note: Infrastructure is one of many contributing factors to these indicators

Source: McKinsey Global Institute

Note: Economic centre of gravity is calculated by weighting locations by Gross Domestic Product in three dimensions and projected to the nearest point on the Earth’s surface. The surface projection of the centre of gravity shifted north over the course of the 20th century, reflecting the fact that in three-dimensional space America and Asia are not only “next” to each other, but also “across” from each other.
DRAFT NEEDS 6  
Support Victoria’s changing, globally integrated economy

Need A: Boost tourism through infrastructure provision

Victoria’s natural and cultural assets make it an attractive destination for visitors, particularly Asia’s growing middle class. However, there is a perception that stagnating growth in international tourism, particularly to regional Victoria, has been exacerbated by a lack of supporting infrastructure.

Visitors, however, are not limited to international tourists. They can also include Victorian residents and businesses visiting regional areas for services, events and facilities. An example is firms hosting a conference at a regional venue, stimulating investment in the local economy. Given the significant growth in visits to Victoria for business purposes, there is an opportunity to make sure Melbourne and regional Victoria are well positioned to respond to this demand. This is where infrastructure could support increased visitor spending and strengthen the state’s tourism industry. This could include the connections between regional cities, which improve access to nearby markets, to ancillary infrastructure in the tourism sector that enhances the attractiveness of Victoria’s national parks and state forests. Infrastructure has a role to play in enhancing the attractiveness of these areas for tourism, thus encouraging private sector investment and job creation.

Secondary objective:  
Lift Victoria’s productivity
Need B: Enable the growth of a highly skilled, digitally connected workforce through infrastructure

Employers are seeking a greater number of technologically capable workers with high levels of education as the state moves to a globally integrated, knowledge-based economy.

As Victoria’s economy becomes increasingly globally integrated, businesses will require a workforce that can leverage robust ICT infrastructure. For example, high bandwidth, resilient and secure networks across Victoria can provide the capability for video conferencing and real-time document sharing on mobile platforms with international customers and clients.

The expectations of employers, combined with the push for lifelong learning, are resulting in a growing demand in the tertiary sector, including higher and vocational education. This is putting pressure on the infrastructure that supports these services. To continue to support workforce participation and provide employers with the skilled workforce they need, Victoria will need to ensure its TAFE and Dual Sector University assets are flexible and technology driven to respond to these demands. For example, there is variation in the condition of assets in Victoria’s TAFE sector, with a third of the assets considered to be in a good condition, a third average and the remaining third poor. Of these, some are surplus or underutilised. The condition of the asset base needs to be considered in the context of changes to the funding arrangements for the sector over the past five years and underutilisation of the assets.

Secondary objective: Lift Victoria’s productivity

ALTERNATIVE NEEDS

An alternative need to develop research facilities that support the growing service sector and commercialisation was considered. Victoria has a range of significant research facilities, such as the Australian Synchrotron, and several globally ranked universities. While there is evidence that Australia’s collaboration between research facilities and large firms and SMEs is poor compared to other OECD countries, it is not clear that this is an infrastructure issue. It is difficult to pin down the factors that make for a successful commercialisation of research outputs.

An alternative need to remove barriers to technology-led transport innovation, including driverless vehicles was considered. It is highly likely that such technology will drive transformational change to the way our networks are planned, managed and used, and this is further discussed on pages 28 to 29.

We also considered focusing the need to boost tourism through infrastructure provision solely on regional tourism, where it is considered that there is the largest potential for growth. However, on balance it was felt that over a 30-year horizon, this infrastructure need will also be relevant to Melbourne and regional cities.

Are these needs more pressing than the ones we have proposed?
Two centuries of economic growth have put pressure on Victoria’s natural resources – resources that are critical for the success of our society and economy.

Today, however, policy choices and new technologies enable states to pursue economic growth in a more environmentally sustainable manner.

Infrastructure is central to this transition, both in terms of reducing the negative impacts of its use and encouraging more efficient and sustainable production and consumption.

**DRAFT OBJECTIVE 7**

Promote sustainable production and consumption

Victoria’s society and economy rely on the natural environment, from the water we drink to the air we breathe. Humans, however, can cause damage that threatens the environmental systems that sustain us. Historically, economic development has relied on production and consumption practices that don’t always account for environmental costs.

Victoria’s environment is vastly different to what it was 200 years ago. It is the most cleared state in Australia, resulting in widespread loss of habitats and the decline of many native species. On a per capita basis, Victoria’s domestic greenhouse gas emissions are among the highest in the world. The consequences of these trends are difficult to reverse and could have long-term impacts on our material wellbeing.

Nevertheless, Victoria is getting better at managing the impact of the economy on the environment and these trends also provide significant opportunities. For example, the state’s installed capacity of renewable energy has almost tripled since 2000 and there are many promising, and potentially highly disruptive, new technologies in this field (eg home batteries). Victoria’s resource recovery rate is rising, though so, too, is the total amount of waste being produced (see figure 9). Regulations exist to ensure water is sustainably used. In the Australian National Outlook 2015, CSIRO claims that sustainable economic prosperity is possible, but policy decisions are essential for enabling the adoption of new technologies to harness opportunities, while managing trade-offs and risks.

Sustainable production and consumption practices can also have broader benefits. Globally, there is a renewed focus on energy, resource and environmental efficiency. These will likely emerge as key drivers of productivity, essential for building a competitive and sustainable economy of the future.

Infrastructure facilitates the operation of the economy, so it is a critical lever for transitioning to a more sustainable and productive state. Decisions that balance environmental impact, efficiency and adaptation, particularly across transport, energy and water, will strongly influence the environmental sustainability of the Victorian economy.

**Infrastructure Victoria’s considerations**

We thought about whether objectives 7 and 8 should be combined. Both relate to the value of the environment, but objective 7 is about its material value to humans, while objective 8 is about its intrinsic value irrespective of humans. We’re not sure if this distinction is necessary. The implications are different, but both share the fundamental aim of protecting the environment. What do you think?
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Agricultural production (proxy for nutrient, water, pollination flows)
- Waste generation per capita, waste disposed to landfill, recovery rates
- Fish stocks, timber resources, mineral reserves
- Renewable energy production

Note: Infrastructure is one of many contributing factors to these indicators

Figure 9: Although the recovery rate is rising, Victorians are forecast to generate over 50 per cent more waste over the next 30 years, of which approximately 150 million tonnes is expected to go to landfill – enough to fill 500 MCGs

DRAFT NEEDS 7
Promote sustainable production and consumption

Need A: Improve rural and regional water security

Victoria’s history of drought makes us acutely aware of how important it is to manage this resource sustainably. Water management must balance needs of the environment and mitigate the environmental impact of use. This issue is most acute in the rural and regional context.

In regional centres this results in towns with water supply challenges and vulnerability to climate variability. In rural Victoria, many communities are reliant on water for irrigation purposes and this places high demand on the available resource, with environmental flows needed to ensure the health of waterways. In the north of the state, all water is fully allocated and tradeable.

Victoria’s open channel irrigation systems lose generally around 30 per cent of the total water volume through leakages and inefficiencies in the flow. This is a significant loss and will only be compounded as certain parts of Victoria, such as the north-west, continue to be affected by drought.

Secondary objective:
Support climate change mitigation and adaptation
Waste is an outcome of human development. Despite increasing rates of recycling across Victoria, growth in population and industries will mean more waste. Current trends indicate that total waste generation could almost double over the next 30 years. Furthermore, the composition of this waste is changing due to different products and manufacturing processes. While there is capacity to meet landfill demand for the next 10 years, there are increasing pressures on landfills and resource recovery centres. Though Victoria recovers two-thirds of its waste, there are efforts to grow this share by encouraging markets in recovered resources and leveraging technology. Recovering more waste will improve the sustainability of the state’s production and consumption by reducing reliance on resources. Despite increases in resource recovery and reductions in per capita waste generation, demand for landfill is likely to exceed capacity over the medium to longer term, underlining the importance of protecting existing infrastructure and integrated land use planning for future sites. And without reduction in the generation of waste entering the system, pressure on existing waste infrastructure will occur sooner.

**Secondary objective:**
Respond to population growth and change

**ALTERNATIVE NEEDS**

An alternative need related to Melbourne’s water security was considered. However, urban water use has fallen below levels recorded 10 years ago and with increases to supply, including the desalination plant, there is a high degree of resilience in Melbourne. It is a different story in the rural and regional context, with supply challenges and vulnerability to climate variability.

An alternative need to improve the efficiency of water infrastructure was considered, but Victorian water businesses generally perform well in terms of losses per customer, despite more frequent water main breaks.

Consideration was given to a need relating to the impacts on our natural resources from human activity, such as contamination in our waterways. However, discussion on such needs is better located under draft objective 8.

*Are these needs more pressing than the ones we have proposed?*
Beyond protecting access to, and supply of, natural resources, the environment also has intrinsic value. Yet many of Victoria’s natural environments, some considered globally significant, are threatened by ‘business-as-usual’ population and economic growth.

There are often trade-offs between human settlement and environmental conservation. Fundamentally, infrastructure is used to alter the natural environment to make it easier and safer for humans to live and do business. This can cause environmental harm, as demonstrated by climate change and the impact of growing cities on habitat loss, water use and waste disposal.

For example, a growing number of native fauna and flora species are under threat of extinction, and biodiversity loss is continuing in Victoria. In many regions, Victoria’s rivers are considered to be in poor or very poor condition (see figure 10).

To minimise harm caused, infrastructure needs to be carefully planned, intelligently designed and, sometimes, restricted. Infrastructure can also be used to protect and enhance natural environments. For example, well-designed wastewater treatment facilities can provide habitats for endangered migratory bird species.

**Infrastructure Victoria’s considerations**

As previously explained, this objective is primarily about valuing and protecting the environment for its own sake, though of course its protection may benefit us as well (eg contact with nature has been shown to improve health and wellbeing). To use a technical term, this objective counteracts the anthropocentric (human-centred) view expressed in objective 7. Does this idea appeal to you?
POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Extent of native vegetation and ground cover
- Air, water, river and soil quality
- Number of threatened species

Note: Infrastructure is one of many contributing factors to these indicators.
DRAFT NEEDS 8
Protect and enhance natural environments

Need A: Help preserve natural environments and minimise biodiversity loss through infrastructure

Victoria’s national parks and other protected areas such as state parks seek to conserve biodiversity and natural environments. These healthy ecosystems also provide ‘ecosystem services’ such as water catchment and filtration, as well as economic benefits – many regional tourism offerings showcase the state’s natural assets and generate jobs in tourism. More generally, these environments are part of what makes Victoria unique and are part of our culture, including our indigenous heritage.

Pressure on these areas is expected to increase, including through demand for increased visits. Parks Victoria report 37.8 million visits to national parks in 2014–15, with total park demand exceeding projections. This could have negative consequences for the biodiversity in these areas and the proper functioning of these natural environments.

Physical built assets can aid in the creation, protection and monitoring of biodiversity and the natural environment. Such infrastructure includes fishways, biodiversity tunnels and fencing for feral pests. It also includes facilities that minimise impact, such as suspended ramps over grasslands. However, in some cases this infrastructure is in poor condition, with capacity of these assets not meeting current demand.

Secondary objective:
Promote sustainable production and consumption
Need B: Improve the health of waterways through infrastructure

In 2010, an assessment of river condition by the Victorian Government found only 12 per cent in excellent condition, 11 per cent in good condition, 43 per cent in moderate condition, 19 per cent in poor condition and 13 per cent in very poor condition.

There are a number of significant threats to waterway health in Victoria. These include river contaminants that put water quality at risk, but also other factors such as pesticides, heavy metals and temperature, which affect water quality at local and regional levels. Water salinity is a critical issue for lowland inland waters and while Victoria has some naturally occurring saline areas, most salinity has been caused by native vegetation clearing or excess irrigation. Stormwater flows also play a major role in eroding urban waterways and damaging ecological health.

It is important that stormwater runoff is managed in a way that mitigates damage to waterway health. The ability of water infrastructure, including stormwater drainage, to deal with the impacts on Victoria’s waterways is important, as is understanding how infrastructure contributes to poor waterway health.

Secondary objective:
Support climate change mitigation and adaptation

ALTERNATIVE NEEDS

An alternative need to ensure infrastructure is provided to protect natural assets from the impacts of visits was considered. However, impacts on natural assets are drawn from a number of areas beyond tourism – feral pests, for example, are a major cause of impacts to biodiversity. As a result, evidence that tourism is a major driver of pressure on natural assets is unclear.

Are these needs more pressing than the ones we have proposed?
Climate change is a global issue that will have far-reaching consequences for Victoria’s society, economy and environment. Concentrations of greenhouse gases in the atmosphere are rising, which is projected to lead to changes in Victoria’s climate systems (see figure 11). Over the long term, Victoria is projected to experience higher temperatures, more frequent droughts, higher bushfire risk, sea level rises and more intense storms. This has implications for all sectors and industries, from agriculture to health, and the infrastructure that supports them.

Actions and policies to mitigate climate change will also impact the state. Policy settings and agreements at the global, national and state level will see a progressive decarbonisation of Victoria’s economy over the coming decades. Most of Victoria’s emissions come from fossil fuel-based electricity generation. Changing the way electricity is produced and used is therefore the primary opportunity for emissions abatement. Transport and the built environment also offer significant emissions abatement opportunities.

Infrastructure, along with land use planning, is central to Victoria’s climate change response. Given its enduring nature, well-planned, designed, located and maintained infrastructure can vastly improve Victoria’s resilience to natural hazards, which are expected to become more intense and frequent as the climate changes. Infrastructure systems and operations can also encourage the behaviour change and adoption of new technologies necessary to transition to a low-carbon economy.

Understanding the relationship between infrastructure and climate change can help minimise future costs and exposure to risks and maximise co-benefits, such as more efficient energy use, better public health and the growth of new industries.

**Infrastructure Victoria’s considerations**

There is uncertainty about how the effects of climate change will be felt over time. This makes planning for these effects necessary, but complex. What we do know for certain, however, is that Victoria will be required to meet emission reduction targets aimed at mitigating climate change. We think both of these aspects need to be considered in long-term infrastructure planning. What do you think?
Figure 11: In 2050, under a high emissions scenario, the climate of Melbourne will be more like Adelaide now, Hamilton and Colac will be more like Melbourne, Bendigo will be more like Shepparton, Shepparton will be more like Griffith, and Wangaratta and Benalla will be more like Dubbo.

Source: Victorian Department of Environment, Land, Water and Planning, Climate ready Victoria (statewide), 2016

POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Victorian greenhouse gas emissions
- Carbon stored in the landscape

Note: Infrastructure is one of many contributing factors to these indicators.
While there are significant brown coal reserves to meet Victoria’s energy needs many years, a number of factors (including the impact of international policies, like the global agreement in Paris) will likely result in changes to policy and demand. Coal fire-powered electricity represented 84 per cent of Victoria’s energy use in 2014; however, there are a number of reasons why this reliance presents problems. First, the average age of Victorian coal-fired power stations is more than 34 years. As plants approach their end of life, either significant expenditure is required to refurbish ageing plants or replacement plants must be built. Second, the existing asset base is no longer meeting community expectations for environmental and health outcomes. Third, growing policy and technological changes, potentially facilitated by Federal Government policy or international treaties, could bring on a broadened energy mix with greater renewable energy generation. However, there is a range of existing barriers to pursuing alternative forms of energy generation in Victoria, including the configuration of the grid, which is likely to restrict large-scale renewables projects in western parts of Victoria.

Secondary objective: Promote sustainable production and consumption
**Need B: Adapt infrastructure to changing climate conditions**

The risk of higher temperatures, sea level rises and increasing droughts will impact infrastructure in a number of ways. Some industries may be forced to fundamentally change. For example, the agriculture industry will be particularly exposed as farms in the north of Victoria may need to change what they produce over the decades to come.

High temperatures may increase the costs of maintenance and replacement of infrastructure. Some infrastructure will need significant modification and some sectors will need to change the services they provide. Coastal protection may require investment to address the associated risks with sea level rise. For example, the Barwon South West region is forecast to come under pressure from rising sea levels and storms. Some roads may need to be relocated or protected by new infrastructure.

Urban heat may also become a significant compounding risk. The City of Melbourne’s Urban Landscape Adaptation Program in 2010 and its Urban Forest Strategy 2012–32 respond to this threat, seeking to protect people, businesses, trees and other environmental assets by doubling tree canopy cover, creating street permeability and water-sensitive design.

**Secondary objective:**
Promote sustainable production and consumption

**ALTERNATIVE NEEDS**

An alternative need to plan infrastructure to help mitigate the effects of changing weather patterns on agriculture was considered. This alternative need was initially framed around stranded assets (infrastructure no longer required) in the agriculture sector as a result of the changing climate. However, there is no clear evidence that this is a significant issue. It is likely that, for example, the transport and water infrastructure in climate-impacted locations will still be required, despite changes to the industry profile.

An alternative need to remove or reduce market inefficiencies that hinder renewable energy production was considered, but evidence suggests that this is not primarily an infrastructure issue.

Are these needs more pressing than the ones we have proposed?
Unexpected events are likely to disrupt Victoria’s society, economy and environment over the coming decades.

These shocks could be anything from natural disasters, pandemics, ICT disruptions, global economic crises and terrorism, to more minor, but more frequent disruptions to transport networks.

The state’s vulnerability to these shocks will be partly determined by the resilience and adaptability of its infrastructure.

In an increasingly connected world, unexpected economic, political, environmental and technological events can significantly affect our state (see figure 12 for a summary of global risks). Recent examples of these shocks are the Global Financial Crisis, terrorist attacks, Black Saturday bushfires, flu pandemics, reduction in Chinese demand for commodities and the increasing use of disruptive technologies such as Uber and Airbnb.

Unexpected shocks can also be of short duration and very local. For example, an unexpected disruption to a major Melbourne transport pinch point, such as a lane closure on the West Gate Bridge or signal failure in the City Loop, can have wide-ranging impacts on the transport network.

Making sure Victoria’s physical infrastructure is resilient and/or that adequate alternatives exist in the face of these events is important to ensure that services continue even when placed under significant pressure.

To ensure that Victoria is able to mitigate the impact of global and local shocks and take advantage of the opportunities that these events may bring, it is important that the state’s infrastructure and public finances are able to adapt and respond positively to these unexpected events.

This involves considering the best time to invest in infrastructure. Building everything now reduces the state’s ability to take advantage of future technological advances and respond to the next natural disaster or economic crisis. We also need to be aware of the major vulnerabilities in Victoria’s network infrastructure and consider the benefits of building redundancy into these relative to the cost of doing so.

It may not be possible to predict what events will happen and when, but ensuring Victoria’s infrastructure and public finances are sustainable and resilient enables government and the community to respond appropriately when unexpected events and challenges arise.

**Infrastrucutre Victoria’s considerations**

Objective 10, perhaps more so than some others, crosses into territory covered in previous objectives. The shocks associated with climate change, also raised in objective 9, are an obvious example. However, we thought it was important to call out resilience as an objective on its own because over a 30-year period, unexpected shocks will likely have major impacts on the state. We’re keen to find out if you agree.
Figure 12: Victoria could be affected by a range of global risks that vary according to impact and likelihood.

POSSIBLE INDICATORS FOR TRACKING OBJECTIVES OVER TIME:

- Economic cost of extreme events
- Supply disruptions in different sectors

Note: Infrastructure is one of many contributing factors to these indicators.


Note: Survey respondents were asked to assess the likelihood and impact of the individual risks on a scale of 1 to 7, 1 representing a risk that is not likely to happen or have impact, and 7 a risk very likely to occur and with massive and devastating impacts.
DRAFT NEEDS 10
Build resilience to shocks

Need A: Improve the resilience of critical infrastructure to disruptive events

Extreme events including extreme weather, pandemics, terrorism and technology disruptions or other damaging events such as power outages or failure of key transport infrastructure (eg train lines or freeways) can have serious implications for the social and economic wellbeing of the state.

High-risk areas require protection and greater resilience against the impacts of extreme events, including rural and regional communities exposed to fire risk. There are also critical assets, for example the proximity of Victoria’s ICT data centres in central Melbourne, which, if they were compromised by an event in the central city, could significantly affect a number of sectors and consumers.

Over the next 30 years, Victoria’s infrastructure will need to become increasingly resilient in an environment where the propensity and severity of extreme events are likely to increase, and where other damaging events can cause major disruption and economic loss. These events will have financial, social and health implications for Victorian communities and, unless managed, a disproportionate impact on some of the state’s most vulnerable people.

Secondary objective:
Support safe, healthy and vibrant communities
Need B: Address infrastructure-related emergency response challenges

Victoria’s emergency response network encompasses a range of services from ambulance, fire and law enforcement. Significant steps have already been taken towards the coordination of emergency response, overseeing an all-hazard, all-agency approach. This coordinated approach looks beyond the traditional bounds of the assets that constitute the sector, and considers their best use.

The unpredictable nature of these emergencies, such as their scale, means Victoria must have systems that can effectively respond and are resilient under varying circumstances. Infrastructure both plays a key role in communications for an emergency, particularly through ICT, and in facilitating the response, such as tram-separated roads being utilised by emergency vehicles.

The challenges are also varied depending on the location. High and increasing densities in the central city pose a very different challenge in responding to a major emergency compared to regional areas, where the distance between physical assets and the affected area is often more relevant. Greater community resilience, including through the building design, will provide an opportunity to manage emergencies.

Secondary objective: Support safe, healthy and vibrant communities

ALTERNATIVE NEEDS

Alternative needs that focused on specific assets that were most exposed to shocks, such as the Underground Loop, were considered. However, it did not make sense to call out such infrastructure specifically as the responses often require a broader response across multiple sectors.

Are these needs more pressing than the ones we have proposed?
GETTING INVOLVED
YOUR VIEWS ARE CRUCIAL TO SHAPING INFRASTRUCTURE VICTORIA’S 30-YEAR STRATEGY.

We want to talk to, hear from and work with all Victorians.

YOU HAVE AN OPPORTUNITY TO HELP LAY THE FOUNDATIONS OF THE STRATEGY.

The conversation about objectives and needs starts here.

MAKE SURE YOU HAVE YOUR SAY.

Take part in online discussion forums, explore our interactive tools or make a formal submission.

How can I get involved?

Laying the foundations for a successful 30-year infrastructure strategy for Victoria will require input from stakeholders and the community. The conversations will cover what trade-offs Victorians are prepared to make to secure the future they want.

Formal consultations on the draft objectives and needs will open on Monday 15 February 2016 and close on Friday 11 March 2016.

To take part in online forums, explore our interactive tools or make a formal submission online, visit yoursay.infrastructurevictoria.com.au. Alternatively, you can send formal submissions to us by mail at Infrastructure Victoria, Level 34, 121 Exhibition St, Melbourne VIC 3000.

Tips for providing feedback:

• keep your responses concise and to the point
• try not to jump to possible solutions (these will be considered in the next phase of work); instead focus on specific objectives and needs
• where possible, provide submissions online

WHAT YOU’VE TOLD US ALREADY

In a recent survey, respondents provided feedback about the 30-year infrastructure strategy and how they would like to receive information from Infrastructure Victoria. Key themes included:

• take the politics out of long-term infrastructure planning
• be transparent about the process
• communicate and consult widely
• consider needs of regional communities
• improve strategic and long-term transport planning

Respondents said of the nine key sectors, they were most interested in transport infrastructure (91 per cent) followed by energy (47 per cent) and water (46 per cent).

The survey showed a strong preference for receiving information via online channels, with more than 97 per cent of respondents preferring updates via email. As a result of this feedback, we will be providing a number of opportunities for people to get involved through online channels and on our website.

A full report about the feedback provided is available at yoursay.infrastructurevictoria.com.au.
There are a number of ways the community, business and government will be brought into the conversation throughout 2016.

In the second quarter of 2016, Infrastructure Victoria will release a paper outlining possible options to meet infrastructure needs. You will be invited to provide feedback on the options by participating in online discussion forums, using interactive tools or making a formal submission.

In mid-2016, a group of everyday Victorians will come together to form two citizen juries (one metropolitan and one regional) to deliberate on what we should do to meet Victoria’s infrastructure needs. Jury members will be randomly selected to ensure a broad representation from across Victoria. Stakeholder and community feedback provided in response to the options paper will form part of the juries’ deliberations as they consider and build consensus about what is needed for Victoria’s future. To find out more about citizen juries and how they will inform the development of the strategy, please visit yoursay.infrastructurevictoria.com.au.

In the third quarter of 2016, Infrastructure Victoria will release a draft strategy outlining proposed recommendations. You will again be invited to contribute your views via online forums or tools, or by making a formal submission.

Infrastructure Victoria will also hold a number of one-on-one meetings and consultation sessions throughout 2016 to allow key infrastructure stakeholders to have their say and share their expertise.

To keep up-to-date with events and future opportunities to contribute feedback and ideas, sign up to our consultation register at yoursay.infrastructurevictoria.com.au.
Sources

Infrastructure Victoria technical reports


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Infrastructure Victoria is an independent advisory body, which began operating on 1 October 2015 under the *Infrastructure Victoria Act 2015*.

It has three main functions:

- preparing a 30-year infrastructure strategy for Victoria, to be refreshed every three to five years
- providing written advice to government on specific infrastructure matters
- publishing original research on infrastructure-related issues

Infrastructure Victoria will also support the development of sectoral infrastructure plans by government departments and agencies.

The aim of Infrastructure Victoria is to take a long-term, evidence-based view of infrastructure planning and raise the level of community debate about infrastructure provision.

Infrastructure Victoria will not directly oversee or fund infrastructure projects.