



# Managing the Environmental Impacts of Transport





VICTORIA

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Victorian  
Auditor-General

# Managing the Environmental Impacts of Transport

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# VAGO

Victorian Auditor-General's Office  
*Auditing in the Public Interest*

The Hon. Bruce Atkinson MLC  
President  
Legislative Council  
Parliament House  
Melbourne

The Hon. Christine Fyffe MP  
Speaker  
Legislative Assembly  
Parliament House  
Melbourne

Dear Presiding Officers

Under the provisions of section 16AB of the *Audit Act 1994*, I transmit my report on the audit *Managing the Environmental Impacts of Transport*.

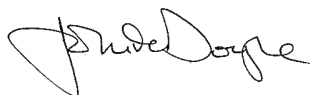
The audit assessed how well the Department of Transport, Planning and Local Infrastructure (DTPLI) is fulfilling its strategic leadership role and how well VicRoads and Public Transport Victoria (PTV) are managing the environmental impacts of transport.

I found that DTPLI did not adequately fulfil this role when developing the state's strategic transport and land-use planning framework. This is because it did not provide the government with any specific advice on how proposed actions would address the environmental impacts of transport, nor did it propose any statewide objectives or targets for reducing transport-related greenhouse gases, other emissions and noise.

VicRoads has a comprehensive plan for improving the environmental performance of the road system, and this is a model of what should exist on a portfolio-wide basis. PTV, on the other hand, does not have a dedicated plan and its performance in this regard has declined since our previous audit, *Public Transport Performance*.

I have made a series of recommendations aimed at addressing these issues. I am encouraged by the commitment of VicRoads and PTV to implementing actions against these recommendations, and encourage DTPLI to fully embrace the recommendations of this report.

Yours faithfully



John Doyle  
*Auditor-General*

20 August 2014



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# Auditor-General's comments



**John Doyle**  
Auditor-General

The Victorian transport system produces significant amounts of greenhouse gases, other air pollution and traffic noise that pose a growing threat to our environment and health. Minimising these impacts has been a legislated objective since the *Transport Integration Act 2010* (the Act) was introduced in July 2010.

Under the Act, the Department of Transport, Planning and Local Infrastructure (DTPLI) has the key leadership role to ensure the transport system is delivered consistent with transport system objectives. The Act requires DTPLI to establish the overarching planning framework within which other transport bodies are to operate. It also requires Public Transport Victoria (PTV) and VicRoads to minimise adverse environmental impacts from the road and public transport systems, respectively, within the context of this framework.

DTPLI finalised the statewide strategic framework, consisting of *Plan Melbourne, Victoria—The Freight State* and the state's eight regional growth plans, in July 2014. The government has subsequently adopted this framework. However, my audit found that during the framework's development, DTPLI did not adequately advise government about how the proposed strategies would address the environmental impacts of transport. The framework also did not propose any statewide objectives or targets for reducing transport-related greenhouse gases, other emissions and noise.

As it does not clarify the environmental objectives it is seeking to achieve, DTPLI's proposed strategic framework is largely aspirational. To increase the likelihood of improved environmental performance, DTPLI needs to set clearly defined expected outcomes and comprehensively report on progress against these.

Across the three agencies examined, I found that VicRoads has the most comprehensive strategy for managing the environmental impacts of the road system. Indeed, its *Sustainability and Climate Change Strategy 2010–2015* is a model of what should exist on a portfolio-wide basis. Encouragingly, this strategy includes specific actions and goals for reducing greenhouse gas emissions, improving air quality and minimising traffic noise impacts, and VicRoads regularly publicly reports on its progress.

Conversely, I found that PTV has not sufficiently progressed options identified by the former Department of Transport on how to improve public transport's energy consumption and greenhouse gas emissions. Additionally, the quality and availability of publicly reported information on public transport's environmental performance has declined since 2012.

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I have made 11 recommendations to address the shortcomings identified by this audit. In particular, the recommendations reinforce the need for DTPLI to develop statewide objectives and a related framework to monitor and report on the performance of the transport system in meeting the Act's environmental sustainability objective.

I am disappointed by DTPLI's less than fulsome acceptance of my recommendations for it to develop a statewide strategy to address the environmental impacts of the transport system. The Act makes it clear that DTPLI's role is to lead all of the strategic policy, advice and legislation functions relating to the transport system, and to determine strategic policies that address related current and future challenges.

As noted in my report, the environmental impacts of the transport system are significant and growing. Addressing this major challenge for the state's current and future generations, and proactively advising the government on potential policy responses is clearly within the scope of DTPLI's obligations under the Act.

The recommendations reinforce the need for PTV to develop a similar framework and to address the shortcomings identified by this audit and our 2012 audit. I also recommend that VicRoads develops arrangements to monitor and report on the environmental impacts of initiatives to improve traffic flow and the mode share of public transport. Encouragingly, both PTV and VicRoads have accepted these recommendations and have committed to address them.

I look forward to receiving updates from these agencies on their progress in implementing the recommendations.

Finally, I would like to thank the staff of DTPLI, VicRoads and PTV for their assistance and cooperation during this audit.



John Doyle  
*Auditor-General*  
August 2014

# Audit summary

## Background

Victoria's transport system is vital for moving people, services and goods, with Melburnians making close to 14.2 million trips across the city each day. Consequently, the environmental impacts are significant and include the production of greenhouse gas emissions, other air pollution and noise.

The transport sector is the second largest producer of greenhouse gases in Victoria. Total emissions from this sector grew by 41.2 per cent from 1990 to 2012 and accounted for 18.72 per cent of Victoria's total greenhouse gas emissions in 2011–12.

Passenger cars are responsible for approximately 60 per cent of Victoria's transport-related greenhouse gas emissions. While total emissions from public transport are significantly lower than from both passenger and freight vehicles, in Victoria trams and trains are particularly greenhouse gas-intensive modes as they rely primarily on electricity produced from brown coal.

Transportation noise is also of community concern, particularly in residential areas, where exposure to high noise levels can have adverse health and social consequences.

Typical approaches for reducing transport emissions include:

- reducing the demand for travel
- increasing the use of non-vehicular modes
- leveraging new technologies
- reducing emissions from transport infrastructure.

The *Transport Integration Act 2010* (the Act) requires transport agencies to manage the transport system in a way that actively contributes to environmental sustainability. This includes minimising transport-related emissions, promoting less harmful forms of transport and improving the environmental performance and energy efficiency of all transport modes. This objective must be balanced with the other transport system objectives.

Under the Act, the Department of Transport, Planning and Local Infrastructure (DTPLI) has the key leadership role in planning for and managing the transport system in a way that addresses these objectives. VicRoads also has a role in minimising the adverse environmental impacts of the road system and Public Transport Victoria (PTV) has a similar goal of seeking to improve the environmental performance of the public transport system.

This audit assessed whether the environmental impacts of transport are being effectively managed. It examined how well key institutional arrangements support statewide and agency-level strategic planning, monitoring and reporting for managing the environmental impacts of transport, and the effectiveness of key strategies and initiatives in reducing the impacts of transport on the environment.

## Conclusions

The environmental impacts of the transport system are significant and growing. Minimising these impacts has been a legislated objective since 2010, but it is clear that DTPLI has not adequately addressed this when developing the state's strategic transport and land-use planning framework (the strategic framework)—consisting of *Plan Melbourne, Victoria—The Freight State* (VTFS) and the state's eight regional growth plans (RGP).

During the strategic framework's development, DTPLI did not provide the government with any advice about how proposed strategies would address the environmental impacts of the transport system. It also did not propose any defined statewide objectives or targets for reducing transport-related greenhouse gases and other emissions or for limiting the effect of traffic noise.

Without these objectives and standards, DTPLI's proposed strategic framework is largely aspirational. Their absence also significantly reduces DTPLI's accountability for performance and impedes its capacity to effectively oversee and transparently report on the outcomes of related initiatives across the portfolio. Consequently, it is unlikely that agency actions will be effective in minimising the environmental impacts of the transport system.

Across the three agencies examined, VicRoads has the most comprehensive strategy for managing the environmental impacts of the road system, and this is a model of what should exist on a portfolio-wide basis. The strategy has specific goals and actions for reducing greenhouse gas emissions, improving air quality and minimising traffic noise impacts. VicRoads also regularly reports on progress and can demonstrate that it is improving the environmental performance of the road network.

However, neither DTPLI nor PTV has a corporate strategy with clear objectives, targets and performance measures for environmental performance. This means they cannot demonstrate that their actions to minimise the environmental impacts of the transport system have been effective.

It is particularly concerning that public reporting by both agencies on relevant indicators has diminished substantially over time and that PTV has failed to act on previous recommendations to improve its management and reporting on the environmental performance of public transport.

## Findings

### Statewide strategic planning and governance

DTPLI advised that *Plan Melbourne*, VTFS and the RGP's contain 'the mix of integrated actions considered best able to achieve the state's desired outcomes, including environmental outcomes'. However, its claim cannot be verified, because during the framework's development DTPLI neither clarified nor advised the government on what specific environmental outcomes its proposed strategic framework seeks to achieve.

Specifically, DTPLI's related advice omitted critical details on statewide objectives, targets and performance measures for minimising the environmental impacts of transport, including for reducing greenhouse gases and other emissions.

This means the strategic framework developed and proposed by DTPLI did not provide a clear basis for transport agencies to align their policies and actions. The lack of targets and performance measures also significantly impedes DTPLI's ability to measure the effectiveness of agencies' progress against statewide objectives and to assess whether the aims of the strategic framework and desired environmental outcomes have been achieved.

DTPLI advised that this framework has since been adopted by the government.

### Environment-related content in the strategic framework

The strategic framework developed by DTPLI recognises the link between proposed actions and their potential to minimise harm to the environment from the transport system.

Specifically, *Plan Melbourne* promotes an efficient and more environmentally sustainable city shape based on modelling that shows a smaller number of larger activity centres, with contained fringe growth, will increase carbon efficiency. However, DTPLI did not define the related outcomes and targets for agencies to work towards to achieve the environmental sustainability objective of the Act.

*Plan Melbourne* encourages an increase in public transport, cycling and walking, and VTFS seeks to promote a shift to rail freight. While these initiatives support the achievement of a more sustainable transport system, DTPLI cannot assess their effectiveness in the absence of clearly defined objectives and targets. In the absence of DTPLI developing a comprehensive monitoring and reporting framework with clearly defined expected environmental outcomes and performance measures, the strategic framework currently remains aspirational in this regard.

### Advice to government

DTPLI did not advise the government on options for *Plan Melbourne* to address the environmental sustainability objective of the transport system.

During the development of *Plan Melbourne*, the Ministerial Advisory Council (MAC) proposed a number of detailed actions and specific targets to minimise the environmental impacts of transport. However, DTPLI did not advise the government on the merits or otherwise of the MAC's proposed actions and targets, and these were not adopted in the final strategic framework.

During the audit, DTPLI asserted that targets are a matter for government and are not necessary for measuring progress.

However, the establishment of clear targets and benchmarks for assessing the achievement of objectives is a fundamental and widely accepted practice of good governance and public administration. They are also necessary for transparently assessing the adequacy of progress made. While the government has the prerogative to adopt or reject proposed targets, this does not negate DTPLI's obligation to provide frank and fearless advice to the government on the merits of such targets. It also does not preclude DTPLI from establishing such standards internally, including performance monitoring arrangements to assess the impacts of its initiatives and to transparently demonstrate its environmental performance to the government.

## Statewide governance and monitoring arrangements

DTPLI's Transport Planning Group, which has responsibility for coordinating with other transport agencies across the portfolio, does not actively monitor progress against the transport system objectives, including the environmental sustainability objective.

Therefore, while DTPLI has a Transport Outcomes Framework (TOF) for measuring the impact of transport system actions in achieving the Act's objectives, this is not being actively monitored. The absence of statewide targets for key indicators also significantly limits the TOF's effectiveness.

DTPLI advised that it is currently developing a new TOF that will better support the monitoring of outcomes against the Act's environmental sustainability objective. However, this work is still at a very early stage. DTPLI should ensure that this initiative is complemented by public reporting against statewide targets for defined environmental outcomes.

## Managing the environmental performance of the road and public transport system

The Act requires all transport agencies to develop corporate plans that give effect to their obligations under the Act and support achievement of the transport system's objectives. DTPLI's corporate plan must also specify strategic priorities and performance measures for the transport system, against which VicRoads and PTV must align their plans.

## DTPLI corporate planning and reporting

DTPLI's current corporate plan, developed in 2011, does not define specific strategic priorities and performance measures for managing the environmental performance of transport. An updated plan for 2013–14, still in draft form, is yet to include any specific objectives to address improving the environmental performance of the transport system.

Consequently, DTPLI's corporate plan does not adequately support the achievement of the Act's environmental sustainability objective nor provide an adequate basis for guiding VicRoads and PTV to effectively align their corporate plans and related strategies with DTPLI's.

Further, DTPLI does not systematically report on environmental outcomes achieved across the portfolio, and has discontinued many of the outcome measures previously reported by the former Department of Transport (DOT). While it continues to report on public transport patronage, this measure alone is not sufficient for assessing whether the environmental performance of the transport system has improved.

## VicRoads corporate planning and reporting

VicRoads has the most advanced strategic planning and reporting framework of the three agencies audited. Its *Sustainability and Climate Change Strategy 2010–2015* addresses the key environmental impacts of the road system and establishes clear goals to reduce transport-related greenhouse gas emissions, improve air quality and minimise traffic noise impacts. It is underpinned by key performance indicators (KPI) to measure progress, clearly assigned responsibilities for action, internal monitoring of emissions abatement outcomes achieved and regular public reporting.

These arrangements are encouraging, as they support transparency and accountability for performance. However, most KPIs are output focused, and thus the framework could be further improved by developing measures to assess the impact of related actions on improving the environmental performance of the road system.

VicRoads advised that it is currently updating its strategy with new strategic directions and corporate KPIs. Although this work is at an early stage, it expects these directions will include a focus on further enhancing measurement of greenhouse gas abatement and the improvement in air quality and noise as a result of implemented actions.

## PTV corporate planning and reporting

Our 2012 audit, *Public Transport Performance*, identified a number of shortcomings in the former DOT's approach to managing and reporting on the public transport system's environmental performance. However, PTV has made little progress on implementing related recommendations.

Importantly, PTV has yet to develop a dedicated strategy for managing and reporting on the environmental performance of the public transport system. Publicly reported information by PTV related to the system's environmental performance has also significantly decreased since 2012. In addition, its current corporate plan does not specify any actions for improving the environmental performance of public transport.

PTV's network-level plans aim to boost public transport mode share, as well as mode shift from cars. They also outline some limited strategies for improving energy usage and associated pollution. However, there are no explicit goals or targets for these initiatives, so their effectiveness cannot be transparently assessed.

During the audit PTV developed a new draft corporate plan which has more explicit strategic priorities to improve the mode share of public transport and reduce the environmental footprint of the public transport system. This is encouraging, however, PTV needs to develop detailed actions, targets and performance measures to support the achievement of these goals and address the shortcomings identified by this audit and our previous 2012 audit, *Public Transport Performance*.

## Lessons from other jurisdictions

South Australia and Transport for London represent better practice examples for setting clear, measurable strategic objectives and targets for improving environmental performance. Both jurisdictions have clearly defined environmental strategic priorities and actions, including targets that support transparent reporting on the environmental performance of their transport system.

## Impact of recent agency initiatives

### DTPLI initiatives to improve the transport system's environmental performance

DTPLI is undertaking a number of initiatives to move towards a more sustainable transport system. Key initiatives include a focus on making it easier for people to use more sustainable forms of transport and improving the environmental performance of the transport fleet.

Two of its related actions, FleetWise and the electric vehicle trial, have potential environmental benefits, and DTPLI should investigate how these can be more actively leveraged across the broader transport system.

### Initiatives to manage the environmental impacts of the road system

VicRoads is systematically addressing the key environmental impacts of the road system through the mix of coordinated actions and initiatives under its *Sustainability and Climate Change Strategy 2010–2015*. Encouragingly, it has also demonstrated positive outcomes to date.



For example, by replacing incandescent traffic signal installations with LED lanterns between 2010 and 2012, VicRoads has delivered an estimated 11 241 tonnes of carbon dioxide equivalent savings in greenhouse gas emissions a year.

## Initiatives to manage the environmental impacts of the public transport system

PTV has not made sufficient progress in improving the energy consumption and related emissions from public transport. Our 2012 audit, *Public Transport Performance*, noted that the former DOT's draft internal report from November 2011, *Victorian Public Transport Energy Consumption and Greenhouse Gas Emissions*, recommended steps to better manage and measure public transport's energy consumption and greenhouse gas emissions. The audit also highlighted the need for the former DOT to develop an implementation plan to do this. While the former DOT committed to address this, PTV has yet to develop such a plan.

PTV has also not investigated the costs and benefits of sourcing energy from renewable energy sources, which represents a key opportunity to improve the environmental performance of the public transport system.

## Recommendations

Number	Recommendation	Page
	That the Department of Transport, Planning and Local Infrastructure, in consultation with other transport agencies:	
1.	develops a statewide strategy that sets out clear strategic priorities and actions, with statewide objectives, targets, and performance measures to address the environmental impacts of the transport system	25
2.	reviews its governance arrangements and establishes mechanisms to monitor and coordinate related agency actions	25
3.	establishes arrangements to measure and report on the performance of the transport system and related agencies in meeting the environmental sustainability objective of the <i>Transport Integration Act 2010</i> , including improvements in greenhouse gas emissions, air quality and noise as a result of portfolio-wide strategic interventions and implemented actions.	25
	That the Department of Transport, Planning and Local Infrastructure:	
4.	ensures that the priorities and performance measures contained in the proposed statewide strategy are reflected in the department's and relevant portfolio agencies' corporate plans.	41
	That VicRoads:	
5.	ensures that key performance indicators developed under its new five-year strategy and corporate plan are outcomes focused to measure the impact of related actions on the environment.	41

## Recommendations – continued

Number	Recommendation	Page
That Public Transport Victoria:		
6.	develops specific actions, targets and related performance measures to support achievement of defined statewide priorities for improving the environmental performance of the public transport system, and publicly reports on its related performance against these measures each year	41
7.	systematically evaluates the environmental outcomes of major investments in public transport including, where relevant, by estimating the vehicle kilometres saved and the associated reduction in greenhouse gas and other emissions relative to defined targets.	41
That the Department of Transport, Planning and Local Infrastructure:		
8.	publicly reports on the outcomes of the FleetWise and electric vehicle trials, and investigates related opportunities for applying any insights to further improve the environmental performance of the transport system.	54
That VicRoads:		
9.	develops arrangements to monitor and report on the environmental impacts of its initiatives to improve traffic flow and the mode share of public transport.	54
That Public Transport Victoria:		
10.	addresses all recommendations from the former Department of Transport's draft Victorian Public Transport Energy Consumption and Greenhouse Gas Emissions report	54
11.	investigates the potential costs and benefits of sourcing electricity from renewable sources.	54

## Submissions and comments received

In addition to progressive engagement during the course of the audit, in accordance with section 16(3) of the *Audit Act 1994* a copy of this report, or part of this report, was provided to the Department of Transport, Planning and Local Infrastructure, VicRoads and Public Transport Victoria with a request for submissions or comments.

Agency views have been considered in reaching our audit conclusions and are represented to the extent relevant and warranted in preparing this report. Their full section 16(3) submissions and comments are included in Appendix A.

# 1 Background

## 1.1 Introduction

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### 1.1.1 Environmental impacts of the Victorian transport system

Victoria's transport system is vital for moving people, services and goods, with Melburnians making nearly 14.2 million trips across the city each day. However, the environmental impacts are significant and include the production of greenhouse gas emissions, other air pollution and noise.

#### Greenhouse gas emissions

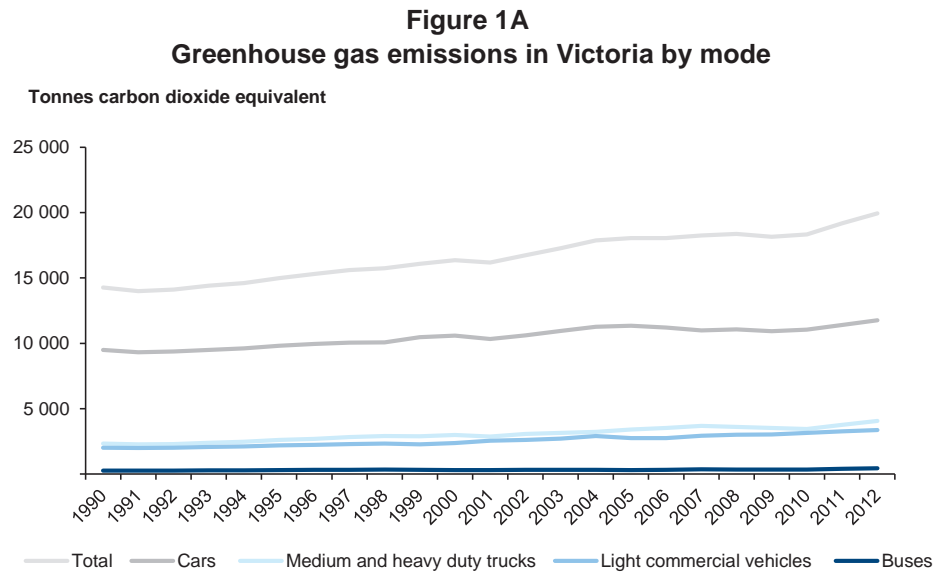
Under the United Nations Framework Convention on Climate Change, the Commonwealth Government has committed the nation to unconditionally reducing its emissions by 5 per cent compared with 2000 levels by 2020. It has committed a further 15 to 25 per cent reduction by 2020, dependent on the extent of international action.

Victoria's *Climate Change Act 2010* requires the state's responses to climate change to complement those of the Commonwealth, including in relation to targets or caps on greenhouse gas emissions.

The transport sector is the second largest producer of greenhouse gases in Victoria. Total emissions from this sector grew by 41.2 per cent from 1990 to 2012 and accounted for 18.72 per cent of Victoria's total greenhouse gas emissions in 2011–12. Typical greenhouse gas emissions from transport are carbon dioxide and nitrous oxide, which contribute to global warming.



Figure 1A shows the trend in transport greenhouse gas emissions by mode over the past 23 years.



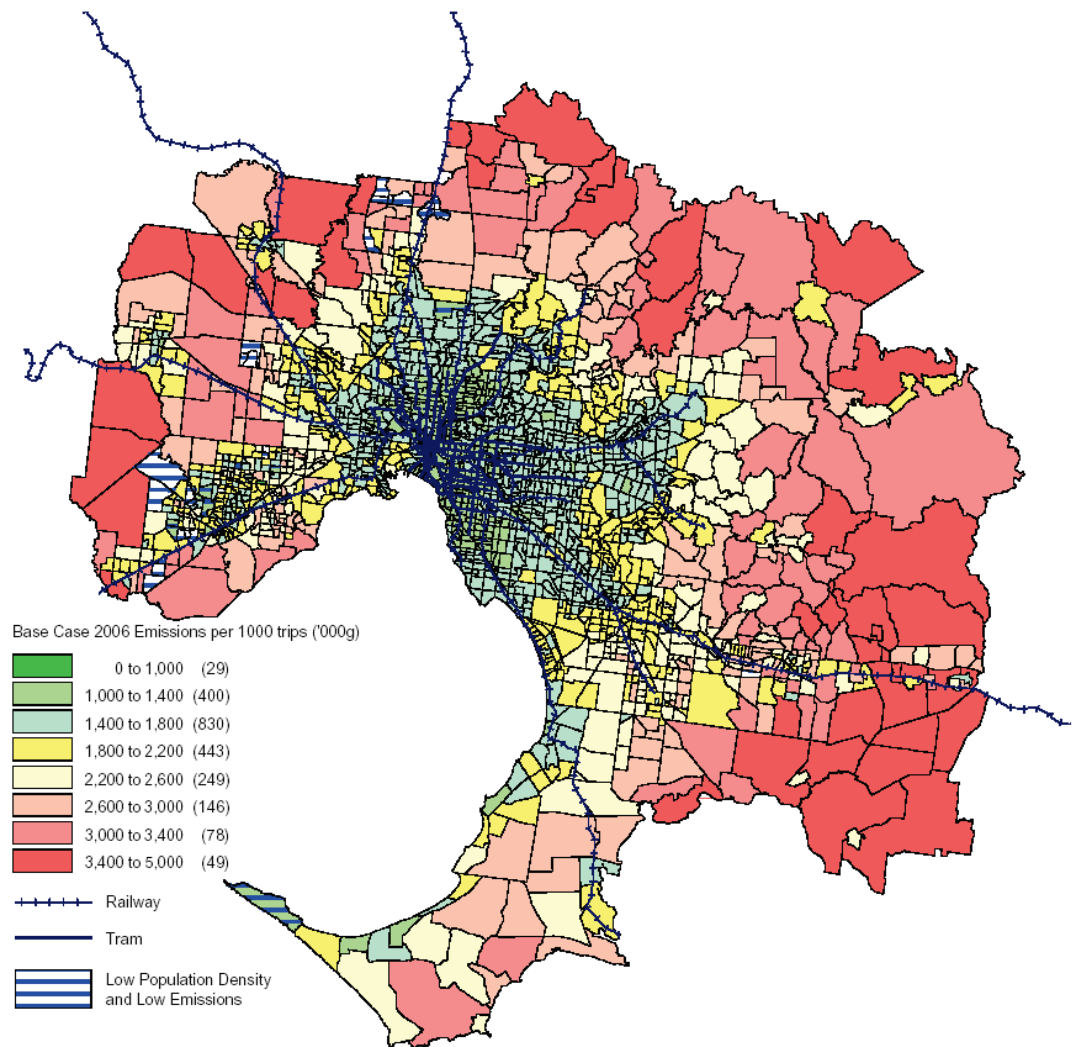
Source: Victorian Auditor-General's Office from the Commonwealth Department of the Environment's National Greenhouse Gas Inventory, Kyoto Protocol Accounting Framework.

Passenger cars are responsible for approximately 60 per cent of Victoria's transport-related greenhouse gas emissions. Emissions from light commercial vehicles and trucks are lower, but freight emissions are expected to double by 2020 from 1990 levels.

Total emissions from public transport are significantly lower than both passenger and freight vehicles—around 871 000 tonnes during 2010–11. However, trams and trains are particularly greenhouse gas-intensive modes as they are major energy consumers that rely primarily on electricity produced from brown coal. Their environmental benefits are therefore greatest when patronage is highest during peak periods, making their per-passenger emissions substantially lower than those from passenger cars.

Average transport emissions per passenger vary across Melbourne, as shown by Figure 1B. The outer suburbs and growth areas tend to have a much higher transport emissions footprint than inner Melbourne due to less public transport, greater reliance on cars, and greater distances travelled to reach activities and services in those areas.

**Figure 1B**  
**Passenger transport greenhouse gas emissions by home location**



Source: Whiteman, J. & Alford, G., 'A Spatial Analysis of Future Macro-Urban Form' 2006, as reproduced in Public Transport Victoria's draft Public Transport Policy Objectives document.

Overall, transport in Australia is projected to remain a high emitter of greenhouse gases in the future. The Commonwealth Bureau of Infrastructure, Transport and Regional Economics (BITRE) estimated that under a 'business as usual' scenario, there will be a 48 per cent increase in transport-related emissions from 1990 levels by 2020.

### Production of other air pollution

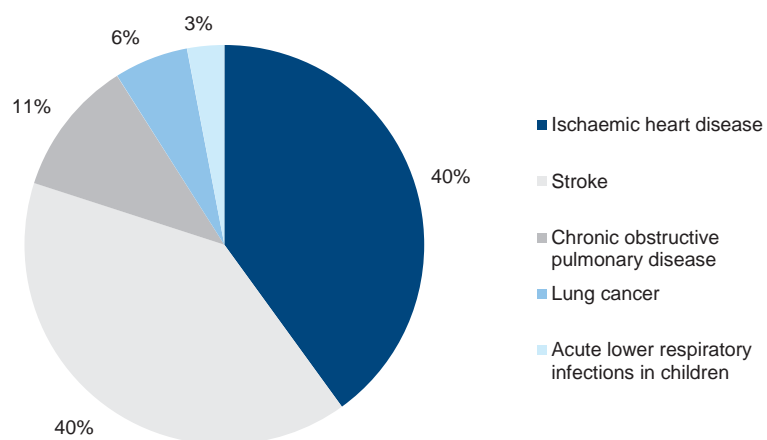
Motor vehicles—including passenger cars, light commercial vehicles and trucks, buses, and motorcycles—contribute up to 70 per cent of total urban air pollution in the Port Phillip Region alone. In particular, they contribute more than 60–70 per cent of nitrogen oxide and up to 40 per cent of hydrocarbons. These chemicals combine to form the main component of photochemical smog.

Motor vehicles are also a major source of particulate matter and various other toxins such as nitrogen dioxide, carbon monoxide, ozone and benzene. Particulate matter that can penetrate the lungs includes particles smaller than 10 micrometres in diameter (PM10) and those smaller than 2.5 micrometres in diameter (PM2.5). The Environment Protection Authority’s (EPA) 2013 report, *Future Air Quality in Victoria*, details that PM2.5 and ozone are the only pollutants expected to breach current air quality standards in 2030. These pollutants have negative effects on the environment, contribute to poor health and reduce the liveability of urban environments.

A 2014 Organisation for Economic Co-operation and Development (OECD) report found that in 2005 Australia experienced 882 deaths related to air pollution. This increased by 69 per cent to 1 483 deaths in 2010. In comparison, 20 of the 34 OECD countries—including the United Kingdom, United States and Germany—experienced a decline in their pollution-related deaths due to stricter vehicle emissions standards over the same time period.

The report estimated the economic cost of these pollution-related deaths in Australia at approximately \$5.8 billion in 2010 and that 50 per cent of this cost can be attributed to air pollution caused by road transport. In particular, a contributing factor is an increase in the use of diesel vehicles, which emit fewer greenhouse gases but higher levels of particulate matter. Small particulate matter can negatively affect respiratory and cardiovascular health and lead to death. Figure 1C shows the breakdown of causes of deaths related to air pollution worldwide.

**Figure 1C**  
Deaths caused by outdoor air pollution—breakdown by disease



Source: Victorian Auditor-General's Office based on Organisation for Economic Co-operation and Development, *The Cost of Air Pollution: Health Impacts of Road Transport*, 2014.

Nevertheless, the EPA's 2013 regulatory impact statement on vehicle emissions regulations reports that exhaust emissions from motor vehicles have decreased substantially over the 10 years from 2001 to 2011, with nitrogen oxide decreasing by 51 per cent, hydrocarbons by 47 per cent and PM10 by 29 per cent. These are expected to further decrease primarily due to improved design standards and the progressive replacement of older vehicles with new ones. However, total emissions from these vehicles will remain significant, particularly as the number of motor vehicles in Victoria is expected to increase from 4 million to over 5 million in the next 10 years. According to BITRE's 2012 *Research Report 127—Traffic Growth in Australia*, total vehicle kilometres travelled (VKT) is also expected to increase by 2.7 per cent per year until 2020.

## Noise

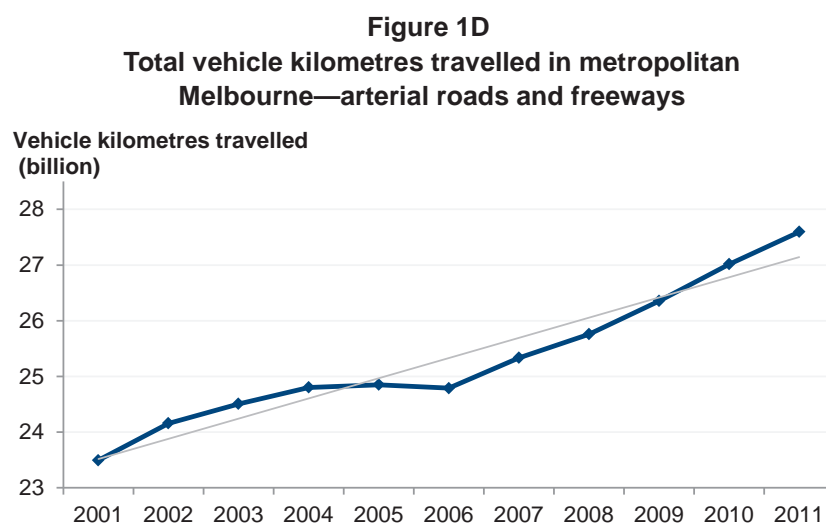
As Melbourne continues to grow, transportation noise will become an increasing source of community concern, particularly in residential areas. The ill effects of high noise levels include physical and psychological health problems, sleep disruption and disturbance to activities such as personal communication and learning.

## 1.2 Snapshot of the Victorian transport system

### A heavy reliance on cars

Victorian passenger traffic is dominated by road transport—particularly passenger cars. In 2011, the former Department of Transport estimated that travel by car accounts for around 77 per cent of all weekday trips, increasing to 81 per cent on the weekends.

Figure 1D indicates that road use has shown strong growth over the past decade, with the total VKT travelled in Melbourne rising 15.4 per cent from 2001 to 2011. Growth has been particularly strong since 2006.



Source: Victorian Auditor-General's Office from VicRoads *Traffic Monitor 2011–2012*, July 2013.

VicRoads divides Melbourne into three zones for the purposes of reporting VKT. Its data shows that most of the growth in car use occurred in Melbourne's outer metropolitan zone. This zone includes all the growth area councils apart from Mitchell. This trend reflects the emissions footprint shown in Figure 1B.

It also reflects the findings from our 2013 report on *Developing Transport Infrastructure and Services for Population Growth Areas*. Specifically, this audit found inadequate transport services and a significant backlog of required public transport in growth areas which have substantially fewer, less frequent and less direct public transport services compared to the rest of Melbourne.

### Trends in public transport, walking and cycling

In Melbourne, public transport currently accounts for 8 per cent of total trips, walking 12 per cent, and cycling 2 per cent.

Population growth is a significant driving factor in past and projected increases in public transport patronage. Since 2005, all forms of public transport have had increased usage—with train patronage increasing by 44 per cent, trams by 22 per cent and buses by 34 per cent. Public transport patronage is similarly expected to double over the next 15 years.

The number of people who cycle as a means of transport has grown steadily over the past 10 years, with trips to work by bike growing at 5 per cent each year between 2001 and 2011. The incidence of walking has also increased by 4.7 per cent between 2001 and 2006. As these modes are the most environmentally friendly, walking and cycling will help to further reduce emissions from the transport sector.

### The growing freight task

The growing Victorian economy is increasing demand for freight transport. In 2012, the Department of Transport, Planning and Local Infrastructure (DTPLI) estimated that the number of shipping containers moving through the ports of Melbourne and Hastings combined is expected to triple by 2035. Most of the metropolitan freight task is carried on road.

VicRoads estimates that truck volumes have been increasing steadily since 2001 at an average of 2.2 per cent per year. Currently, there are over 500 000 commercial vehicles on Melbourne's roads and this is expected to more than double within the next 20 to 30 years.

Of all Australian states, Victoria showed the smallest growth in rail freight between 1961 and 2001—increasing by an average of 1.6 per cent per year. DTPLI estimates that rail freight currently makes up only 1 per cent of Melbourne's freight task and only 3 per cent of Victoria's overall land freight by tonnage.



## 1.3 Options for reducing transport emissions

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The 2008 East-West Link needs assessment study, commissioned by the former Department of Transport, identified various initiatives designed to reduce transport emissions.

These initiatives fall within three general areas of operations—reducing the amount of transport required to meet society's needs, reducing the reliance on cars by promoting more non-vehicular travel, and improving vehicle technology and fuel efficiency. In addition, there are opportunities to improve the environmental impact of infrastructure construction and operations.

### 1.3.1 Reducing the demand for travel

The principal measures available to reduce travel demand involve encouraging different patterns of land use and persuading people to change their personal travel behaviour.

#### Land-use patterns

A city's urban form influences the amount of travel required, with residents of low density areas, such as in the outer suburbs of Melbourne, tending to travel more to reach jobs, activities and services.

Therefore, policies that encourage different patterns of land-use development, with a focus on higher density development, can contribute to reducing transport demand.

#### Changing behaviour

Increasing environmental awareness may help to change travel behaviour. However, to date Australians have shown little inclination to purchase fewer cars, or more environmentally friendly cars.

Australian Bureau of Statistics information demonstrates that, of the 1.7 million households that purchased a motor vehicle in Australia in the 12 months prior to March 2012, only 7 per cent stated that environmental impact was a strong influence when choosing which one to buy. The four main deciding factors were purchase price, fuel economy and running costs, size of vehicle, and type of vehicle.

Other potential strategies involve persuading people to change their personal travel behaviour by reconsidering their need to travel, or to take public or active transport. In 2011, the former Department of Transport identified that there was potential to change the travel habits of Melbournians by targeting:

- **short trips**—encouraging more people to walk or cycle instead of drive
- **trips to school**—increasing the share of trips being made by walking, cycling or public transport
- **single occupant car trips**—increasing car occupancy
- **peak period trips**—encouraging travel outside of peak periods or the use of public transport for those trips.

However, Victoria does not have a strong track record in effectively influencing travel behaviour. Our recent 2013 audit, *Managing Traffic Congestion*, found:

‘While some limited demand management initiatives have been explored and implemented in recent years, such as the congestion levy, carpooling and travel planning programs, they have been neither comprehensive nor sufficient to materially impact demand for road use and related congestion.’

### 1.3.2 Increasing the use of non-vehicular modes

Passenger and freight transport continues to rely on motor vehicles, which produce the most greenhouse gas and other emissions. Promoting other, more environmentally friendly transport modes is a key way to reduce these environmental impacts.

#### Boosting public transport and rail freight

Increasing the availability of public transport by improving related services and expanding the reach of public transport, especially in the outer suburbs, will reduce people’s car dependency, help to reduce congestion on roads and lower greenhouse gas and other emissions.

Further, greater public transport patronage will also help to improve its per passenger kilometre emissions, as trains and trams currently rely on brown coal and therefore have a high greenhouse gas intensity. In the future, as improvements in the stationary energy sector occur, the benefits will have a flow-on effect to public transport and improve its carbon dioxide emissions performance.

Shifting freight from trucks to rail can similarly assist in reducing the number of truck movements and resulting emissions. According to the Energy Efficiency Exchange website—a joint states and Commonwealth initiative—when freight is carried by rail rather than road, it produces 75 per cent less emissions per tonne of freight. However, due to its inherent limitation of fixed tracks and stations, shifting freight to rail would be most beneficial for long-distance freight trips.

VAGO has previously found a lack of investment in both of these areas, specifically:

- Our 2013 report on *Developing Transport Infrastructure and Services for Population Growth Areas* found a significant backlog of required public transport infrastructure in growth areas. It also found that these areas had fewer, less frequent and less direct public transport services compared to the rest of Melbourne.
- Our 2010 audit on the *Management of the Freight Network* similarly found that rail freight has been stagnant or declining because the lack of investment and past institutional arrangements have hampered growth.

### Encouraging walking and cycling

The promotion of walking and cycling, especially for short trips, can further help to reduce reliance on vehicles. In metropolitan Melbourne, over 40 per cent of trips are less than two kilometres in length and almost 65 per cent are less than five kilometres. This suggests that there is room to encourage a shift to active transport which has both environmental and health benefits.

### 1.3.3 Leveraging new technologies

Despite improvements in public transport mode share, motor vehicle use in Victoria is expected to remain high, making it important to leverage improvements in vehicle and emission technologies.

Over the past two decades, significant advances have been made in fuel efficiencies and cars with new types of engines, such as those that run on electricity, that are designed to produce less greenhouse gas and other emissions.

However, in Victoria, the ability of new technologies that utilise power from the electricity grid to impact on greenhouse gas emissions is limited because electricity is sourced from brown coal. If electric vehicles were powered by renewable energy they could provide a low emission transport alternative.

### 1.3.4 Reducing emissions from transport infrastructure

Transport infrastructure can be made more environmentally sustainable during both construction and operations. In construction, recycled resources can be used and leftover construction materials can be recycled at the end of the process. In operations, energy efficient technology can be used to reduce energy consumption—for example, in street lighting and traffic lights.



## 1.4 Managing environmental impacts within the broader transport system

When managing the transport system, agencies are required to implement a range of legislative and policy objectives. These objectives must be balanced with any goal to manage the environmental impacts of transport.

The following sections summarise the legislative objectives for the transport system and provide an overview of agency roles and responsibilities.

### 1.4.1 *Transport Integration Act 2010*

The *Transport Integration Act 2010* (the Act) came into effect in mid-2010 and requires that all decisions affecting the transport system be made within the same integrated decision-making framework and support the same transport system objectives.

Figure 1E summarises the government's vision, objectives and decision-making principles for the transport system set out in the Act. It provides imperatives for transport agencies to actively contribute to environmental sustainability by considering the environmental impacts of the transport system.

**Figure 1E**  
***Transport Integration Act 2010—Vision, objectives, principles***

<p><b>Vision</b></p> <p>The Parliament recognises that Victorians want an integrated and sustainable transport system that contributes to an inclusive, prosperous and environmentally responsible state.</p> <p><b>Objectives</b></p> <p>The transport system should:</p> <ul style="list-style-type: none"><li>• promote social and economic inclusion</li><li>• facilitate economic prosperity</li><li>• actively contribute to environmental sustainability</li><li>• provide for the effective integration of transport and land use</li><li>• facilitate efficient, coordinated and reliable movement</li><li>• be safe and support health and wellbeing.</li></ul> <p><b>Decision-making principles</b></p> <p>Agencies should have regard to the following principles:</p> <ul style="list-style-type: none"><li>• integrated decision-making</li><li>• triple bottom line assessment</li><li>• equity</li><li>• transport system user perspective</li><li>• precautionary principle</li><li>• stakeholder engagement and community participation</li><li>• transparency.</li></ul>
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Source: Victorian Auditor-General's Office.

## Environmental sustainability objective

The Act's environmental sustainability objective is specifically relevant to this audit. It requires the transport system to actively contribute to:

- avoiding, minimising and offsetting harm to the local and global environment—including through transport-related emissions and pollutants
- promoting forms of transport, forms of energy and transport technologies which reduce the overall contribution of transport-related greenhouse gas emissions
- improving the environmental performance of all forms of transport and the forms of energy used in transport.

### 1.4.2 Agency roles and responsibilities

#### DTPLI

Under the Act, DTPLI is responsible for leading strategic policy, planning and improvements relating to the transport system to ensure that it is provided consistent with the vision statement and the transport system objectives. It is also required to:

- collect transport data and undertake research into the transport system to lead strategic policy development and improve the transport system
- collaborate with other agencies to ensure that policies and plans for an integrated and sustainable transport system are developed, aligned and implemented.
- develop strategies, plans, standards, performance indicators, programs and projects relating to the transport system and related matters.

It therefore has the key leadership and coordination role in planning for and managing the transport system in a way that addresses the land use, economic and social needs of Victorians, while protecting the environment.

#### VicRoads

VicRoads plans, develops and manages 22 000 kilometres of arterial roads across the state. Under the Act, VicRoads has to contribute to a sustainable state by managing the road system in a way that seeks to:

- increase the share of public transport, walking and cycling trips as a proportion of all trips in Victoria.
- minimise the adverse environmental impacts of the road system.

#### PTV

Public Transport Victoria (PTV) manages the state's train, tram and bus services. It has key goals under the Act to manage the public transport system in a way that supports a sustainable state by seeking to:

- increase the share of public transport trips as a proportion of all trips in Victoria, including as an alternative to car travel
- improve the environmental performance of the public transport system.

## 1.5 Audit objective and scope

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The objective of the audit was to examine whether the:

- institutional arrangements support effective strategic planning and cross-government coordination for managing the environmental impacts of transport
- key strategies and initiatives for managing the environmental impacts of transport have been effective.

The audit examined how well DTPLI is fulfilling its strategic leadership role and how well VicRoads and PTV are managing the environmental impacts of transport.

## 1.6 Audit method and cost

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The audit was conducted in accordance with the Australian Auditing and Assurance Standards. Pursuant to section 20(3) of the *Audit Act 1994*, unless otherwise indicated any persons named in this report are not the subject of adverse comment or opinion.

The cost of the audit was \$310 000.

## 1.7 Structure of the report

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Part 2 examines whether statewide strategic planning and governance arrangements adequately support the achievement of the Act's environmental sustainability objective.

Part 3 assesses the adequacy of agency-level strategic planning, governance and reporting arrangements for managing the environmental impacts of transport.

Part 4 examines the impact of specific agency actions on minimising the environmental impacts of transport.



# 2 Statewide strategic planning and reporting

## At a glance

### Background

Sound strategic planning, coordination and oversight of statewide actions to manage the environmental impacts of transport is vital to achieving the environmental sustainability objective of the *Transport Integration Act 2010* (the Act).

### Conclusion

The Department of Transport, Planning and Local Infrastructure (DTPLI) did not adequately address the Act's objective of minimising the environmental impacts of transport when developing the strategic framework for statewide transport and land-use planning.

### Findings

- DTPLI did not provide advice to the government regarding the environmental impacts of the transport system when developing *Plan Melbourne, Victoria—The Freight State* and regional growth plans.
- The lack of clear statewide environmental goals, including related performance measures and agency targets, means the current strategic framework is largely aspirational, and unlikely to be effective in minimising the environmental impacts of the transport system.

### Recommendations

That the Department of Transport, Planning and Local Infrastructure, in consultation with other transport agencies:

- develops a statewide strategy that sets out clear statewide objectives, targets and performance measures to address the environmental impacts of the transport system
- reviews its governance arrangements and establishes mechanisms to monitor and coordinate related agency actions
- establishes arrangements to measure and report on the performance of the transport system and related agencies in meeting the environmental sustainability objective of the Act.

## 2.1 Introduction

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Sound strategic planning, coordination, and oversight of statewide actions to manage the environmental impacts of transport is vital to achieve the environmental sustainability objective of the transport system. The *Transport Integration Act 2010* (the Act) requires the Department of Transport, Planning and Local Infrastructure (DTPLI) to develop the strategic planning framework within which transport bodies are to operate.

To be effective, strategic planning needs to be clear about what it intends to achieve and provide direction to agencies for focused and coordinated action. It should therefore clarify agency responsibilities and accountabilities through explicit statewide objectives, targets and associated performance measures.

Sound governance arrangements reinforce these accountabilities and assure effective implementation of initiatives across agencies.

This Part of the report examines whether the statewide strategic planning and governance arrangements developed by DTPLI for managing the environmental impacts of transport are effective.

## 2.2 Conclusion

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DTPLI did not sufficiently consider the need to minimise the environmental impacts of transport in developing the state's strategic transport and land-use planning framework (the strategic framework), which consists of:

- *Plan Melbourne*
- the state's freight strategy, *Victoria—The Freight State* (VTFS)
- the state's eight regional growth plans (RGP).

DTPLI also did not propose any defined outcomes for transport agencies to minimise the environmental impacts of transport and reduce greenhouse gas emissions, other emissions and traffic noise.

The absence of clear statewide goals in this area, including related agency performance measures and targets, means the strategic framework DTPLI proposed is largely aspirational and unlikely to be effective in minimising the environmental impacts of the transport system. The lack of clear goals also significantly impedes DTPLI's capacity to effectively oversee, assess and transparently report on the outcomes of related initiatives across the portfolio.

DTPLI is developing a new monitoring and reporting framework to measure outcomes against the Act's objectives. While this has potential to assist with evaluating the environmental impacts of initiatives, the framework is at a very early stage and thus its comprehensiveness and effectiveness cannot yet be assessed.



## 2.3 Statewide strategic planning

### 2.3.1 Historic focus on the environmental impacts of transport in statewide strategic planning

The need to address the environmental impacts of transport has featured prominently in statewide strategic land-use and transport plans developed since 2002. Related actions and initiatives are summarised in Figure 2A.

**Figure 2A**  
**Strategic planning to manage the environmental impacts of transport**

Policy document	Key objectives, actions and strategies for coordinating public transport
<i>Melbourne 2030—Planning for sustainable growth</i> (2002)	Aimed to reduce greenhouse gas emissions, apply stricter controls on motor vehicle emissions and update standards and procedures for reducing transport noise. Also aimed to increase public transport's share of motorised trips within Melbourne to 20 per cent by 2020 and prioritise walking and cycling and promote sustainable personal transport options.
<i>Linking Melbourne—Metropolitan Transport Plan</i> (2004)	Aimed to manage the environmental impacts of freight and light commercial vehicles, including emissions and noise.
<i>Meeting Our Transport Challenges—Connecting Victorian Communities</i> (2006)	Aimed to promote sustainable travel to reduce the reliance on cars, including improve metropolitan train and tram and regional train services.
<i>Freight Futures: Victorian Freight Network Strategy—for a more prosperous and liveable Victoria</i> (2008)	Aimed to reduce engine noise and reduce greenhouse gas emissions and energy consumption by consolidating and co-locating freight precincts with related activities to reduce distances.
<i>Investing in Transport—East West Link Needs Assessment</i> (April 2008)	Highlighted the challenge to the state posed by climate change and the need to manage greenhouse gas and other air pollution from transport in Victoria. Proposed key policy responses, including reducing travel demand through land-use planning and changing people's behaviour, boosting public transport mode share and promoting improved vehicle technologies.
<i>Melbourne 2030 Audit</i> (May 2008)	Recommended setting targets and implementing programs for reducing car use to complement the state's mode share target and to establish benchmarks and targets for reducing greenhouse emissions.
<i>Planning for All of Melbourne</i> (May 2008)—State's response to <i>Melbourne 2030 Audit</i>	Included activities to help Victoria meet its 20 per cent by 2020 greenhouse gas reductions target, develop a Victorian transport energy strategy, and facilitate investment in renewable energy infrastructure.
<i>Victorian Transport Plan</i> (2008)	Continued the focus on 'lowering our carbon footprint from transport' and included actions to reduce the need to travel, use less polluting forms of transport more often and improve environmental performance.

Source: Victorian Auditor-General's Office.

Our 2013 audit, *Developing Transport Infrastructure and Services for Population Growth Areas*, noted the lack of continuity in Melbourne's succession of previous land-use and transport plans that have often been superseded before they are implemented. It also noted that this has contributed to the failure of previous statewide actions.

Nevertheless, an important feature and strength of the previous statewide strategies was the capacity they provided to clearly align actions with, and assess related progress against, the following measurable and complementary targets:

- increase public transport's share of motorised trips within Melbourne to 20 per cent by 2020
- reduce greenhouse gas emissions by 20 per cent by 2020 from 2000 levels.

The discontinuation and absence of similar targets since 2012 has significantly reduced accountability for performance.

Without defining clear outcomes and related targets which set the foundation for effective implementation and monitoring, the current strategic framework is likely to repeat the patterns of the past.

### 2.3.2 The strategic framework developed by DTPLI

The Act requires DTPLI to develop a transport plan that establishes the overarching planning framework within which other transport bodies are to operate and against which to align its own plans. The plan must be prepared having regard to the vision statement, transport system objectives and decision making principles of the Act.

DTPLI advised that *Plan Melbourne*, VTFS and the RGP's form the statewide strategic transport and land-use planning framework and fulfil the Act's requirement to develop a transport plan. It also advised that this framework contains 'the mix of integrated actions considered best able to achieve the desired outcomes, including environmental outcomes'. However, it is not clear what environmental outcomes DTPLI is seeking to achieve as they have not been clearly defined.

During the framework's development DTPLI did not provide the government with any advice about how proposed strategies would address the environmental impact of the transport system. DTPLI's advice also omitted critical details on statewide objectives, targets and performance measures for minimising the environmental impacts of transport, including for reducing greenhouse gases and other emissions. Therefore, DTPLI's claim that it contains the 'best mix of actions' to achieve environmental outcomes cannot be verified.

This means the framework developed and proposed by DTPLI did not provide a clear basis for transport agencies to align their policies and actions. It also significantly impedes DTPLI's ability to measure the effectiveness of agencies' progress against statewide objectives or to assess whether the aims of the strategic framework and desired environmental outcomes have been achieved.

DTPLI advised that this framework has since been adopted by the government.

## The importance of defining expected outcomes and targets

The strategic framework acknowledges the need to reduce greenhouse gas emissions, other motor vehicle emissions and traffic noise. However, DTPLI's failure to develop clearly defined environmental objectives, targets and goals for the framework means that:

- its intent with regard to the environmental sustainability objective is unclear as it does not define how the transport system will contribute to its achievement
- it does not provide a clear basis for transport agencies to align their policies and actions, and for assuring that they are sufficient for achieving the Act's environmental sustainability objectives
- there is no way to measure the effectiveness of agencies' progress against statewide objectives, or whether the aims of the strategic framework and desired environmental outcomes have been achieved.

During the audit, DTPLI asserted that targets are a matter for government and are not necessary for measuring progress.

However, the establishment of clear targets and benchmarks for assessing the achievement of objectives is a fundamental and widely accepted practice of good governance and public administration. While the government has the prerogative to adopt or reject proposed targets, this does not negate DTPLI's obligation to provide frank and fearless advice to the government on the merits of such targets. Neither does it preclude DTPLI from establishing such standards internally, including performance monitoring arrangements to assess the impacts of its initiatives and to transparently demonstrate its environmental performance to the government.

### *South Australia's approach to setting statewide targets*

South Australia's strategic planning highlights a good practice approach to setting clear and measurable, interrelated targets at the statewide level and agency-level.

The recent *30-Year Plan for Greater Adelaide* has adopted various measurable targets around environmental objectives that are expected to substantially contribute to overall statewide targets set under *South Australia's Strategic Plan (SASP)*. Figure 2B provides an overview of these relevant targets.

**Figure 2B**  
**Contribution and linkages between Greater Adelaide targets with**  
**South Australian statewide targets**

Environmental objective	Target in plan for Greater Adelaide	Relevant statewide target in SASP
Greater urban density and transit oriented development	Seventy per cent of metropolitan Adelaide's new housing will be in-fill development in established areas and 60 per cent of new housing will be within 800 metres of current or extended transit corridors.	Reduce South Australia's ecological footprint by 30 per cent by 2050.
Reduce greenhouse gas emissions	Implementing the plan over 30 years will result in a 20 per cent reduction in South Australia's overall greenhouse gas emissions.	Reduce South Australia's greenhouse gas emissions by 60 per cent of 1990 levels by 2050.
Increase use of public transport and reduce reliance on cars	Public transport use to grow faster than private car use per head of population over five-yearly intervals. Achieve a per capita reduction in vehicle kilometres travelled over five-yearly intervals.	Increase the use of public transport to 10 per cent of metropolitan weekday passenger vehicle kilometres travelled by 2018.
Increase renewable energy	A net increase in renewable energy as a percentage of total energy generation.	Twenty per cent of the state's electricity generation to come from renewable energy by 2014 (achieved) and 33 per cent renewable energy by 2020.

Source: Victorian Auditor-General's Office from *South Australia's Strategic Plan* and the *30-Year Plan for Greater Adelaide*.

### 2.3.3 Environment-related content in *Plan Melbourne* and related advice to government

*Plan Melbourne* is split up into directions, initiatives, and short-, medium-, and long-term actions. The actions are the deliverables of the plan, and their implementation is assigned to relevant agencies or the Metropolitan Planning Authority.

#### Overall assessment of the advice to government during *Plan Melbourne's* development

Our audit reviewed all briefings to portfolio ministers and the government during *Plan Melbourne's* development. These documents show that DTPLI did not provide any specific advice regarding the environmental impacts of the transport system during this time.

The Ministerial Advisory Council (MAC), initially tasked by the Minister for Planning to direct the development of the strategy, proposed a greater number of more detailed actions that supported the achievement of the Act's environmental sustainability objective. These included explicit environment-related actions to:

- establish a target to deliver at least 70 per cent of new dwellings in established areas
- accurately measure and significantly reduce Melbourne's emissions to at least 5 per cent below 2000 levels by 2020 and to 50 per cent of 2000 levels by 2050.

The MAC indicated that particular changes in the transport sector will need to occur for Melbourne to achieve these greenhouse gas reduction targets. These included:

- improving the emissions performance of all transport modes
- reducing reliance on cars and ensuring that the average length of motor vehicle trips does not increase
- doubling the proportion of personal trips made on foot, by bike or public transport
- introducing renewable energy sources for public transport.

These targets and proposals were not adopted in the final plan and DTPLI did not advise the government of their merits or otherwise. Consequently, DTPLI did not adequately consider the need to minimise the environmental impacts of transport when developing *Plan Melbourne*.

The following sections summarise the environment-related content of *Plan Melbourne* and related departmental advice to government.

### *Encouraging efficient land use*

*Plan Melbourne* acknowledges that a city's level of greenhouse gas emissions is partly a function of its urban structure.

It seeks to align housing, jobs and public transport, as it recognises this will have environmental and economic benefits by reducing trip lengths, travel times and costs, thereby leading to a more energy efficient city.

Key directions and initiatives within the plan focused on influencing Melbourne's future shape are based on:

- an expanded central city and major population growth in defined urban renewal sites such as Fishermans Bend, E-Gate and Arden-Macaulay
- a polynodal city with six National Employment Clusters that aim to establish a high concentration of jobs and public transport, and 11 metropolitan activity centres designed to enable people to travel shorter distances
- the concept of 20-minute neighbourhoods, whereby people have access to local services and facilities within 20 minutes of home by walking, cycling or public transport, designed to reduce trip times across Melbourne and in growth areas
- fixing the urban growth boundary, in recognition that Melbourne's outward growth has now stretched to the point where it is impeding access to jobs, goods and services.

## Related advice to government

DTPLI undertook urban form modelling in its development of directions and initiatives for *Plan Melbourne* to encourage efficient land use. This modelling compared the performance of different potential city shapes in promoting improved urban outcomes by 2046 and guided DTPLI's integrated land-use and transport planning. It showed that a smaller number of larger activity centres with contained fringe growth was more effective than a larger number of smaller centres in:

- producing fewer car trips to jobs by increasing the use of public transport and walking and cycling
- promoting better job density and access to employment
- reducing congestion across the wider road network for both freight and passenger traffic
- increasing carbon efficiency by providing the best access to activity centres while also producing the least amount of transport-related greenhouse gas emissions.

However, DTPLI did not advise government to set clear targets for achieving environmental outcomes in relation to land-use actions within the plan.

As a result, while some city shaping actions developed by DTPLI will have an indirect effect on the environment, these do not appear to be driven by, or seek to achieve, explicitly defined environmental outcomes. For example:

- the proposed action to accommodate the majority of new dwellings in established areas within walking distance of public transport has no explicit link to defined environmental outcomes, nor does it specify related targets for reduced trip length and time and the number of new dwellings to be located in established areas
- while the 20-minute neighbourhood concept can lead to a reduction in emissions, the absence of related performance measures and targets means this cannot be assessed.

The urban modelling DTPLI conducted during the development of *Plan Melbourne* quantified expected improvements, including the potential reduction in greenhouse gas emissions from the various urban structures. This could have provided the basis for DTPLI defining expected and measurable outcomes that would allow the evaluation of achievements, however, it did not do this.

### *Boosting non-vehicular modes*

*Plan Melbourne* estimates that, as Melbourne grows from 4.3 million people to about 7.7 million by 2051, the city will need to accommodate an additional 10.7 million trips per day and increase its reliance on public transport. Although not explicit in the plan, DTPLI advised during the audit that mode shift will comprise a substantial proportion of this future patronage growth.

Encouraging mode-shift from cars to public transport will contribute to more effectively avoiding, minimising or offsetting harm to the environment. However, DTPLI has not established what proportion of future public transport trips by 2051 will be due to natural population growth and therefore how many of those trips it will have to divert from cars. DTPLI needs to establish this figure so that it can properly target and understand the mode-shift task.

*Plan Melbourne* identifies the following key infrastructure projects, which were funded under the 2014–15 State Budget:

- \$8.5 billion to \$11 billion for Melbourne Rail Link
- \$8 billion to \$10 billion for the Western section of the East-West Link
- \$2 billion to \$2.5 billion for upgrade of the Cranbourne-Pakenham Line
- \$850 million for the CityLink-Tulla Widening in partnership with the private sector
- \$685 million to remove level crossings.

During the audit, DTPLI advised that the investments announced in *Plan Melbourne* will be a critical contributor to increasing public transport patronage. However, this cannot be verified in the absence of clearly defined objectives, targets and auditable performance information that demonstrates how these projects will contribute to increasing patronage of the public transport system.

#### Related advice to government

DTPLI did not provide any specific advice to government on the environmental benefits of boosting non-vehicular modes nor on the merits of setting clearly defined targets for public transport patronage or mode-shift from cars.

#### *Promoting new vehicle technologies*

*Plan Melbourne* contains no directions or actions to promote improved vehicle technologies, such as electric or hybrid vehicles.

#### Related advice to government

In early planning work on *Plan Melbourne*, new vehicle technologies were identified as an important factor in managing greenhouse gases and other emissions in the context of Melbourne's growing population. There is no evidence of any departmental advice to government on the merits or otherwise of pursuing initiatives that relate to new vehicle technologies.

#### *Improving noise and air quality*

*Plan Melbourne* recognises the high-level need to reduce the environmental and health impacts of air pollution and noise from motor vehicles and freight.

However, the specified action aimed at improving noise and air quality does not seek to reduce the source of that air pollution or noise. Instead it focuses on ensuring that sensitive land uses are not located or designed in a way that would expose people to unacceptable amenity impacts.

#### Related advice to government

DTPLI did not provide advice to the government on the merits of addressing noise and air quality through *Plan Melbourne*.

#### *Promoting energy efficiency and the use of renewable energy*

*Plan Melbourne* does not include information, explicit targets or actions for:

- reducing the energy consumption of public transport and roadside infrastructure
- promoting the use of renewable energy
- improving fuel efficiency.

#### Related advice to government

There is no evidence of departmental advice to the government explaining these potential policy responses, or justifying their exclusion from *Plan Melbourne*.

### 2.3.4 *Victoria – The Freight State*

The Victorian freight and logistics plan recognises the need to address the environmental impacts of freight transport. However, DTPLI did not advise government of the merits of targets to monitor and evaluate the extent to which implemented initiatives contribute to achieving the Act's environmental sustainability objective.



#### Targets for managing freight

A key principle of VTFS includes 'minimising the impacts of freight and logistics activity on the environment'. However, DTPLI has not yet developed measures or targets designed to drive the achievement of specific environmental outcomes or that allow meaningful evaluation of related actions.



VTFS recognises that rail freight has less impact on the environment than road freight and seeks to promote a shift to rail freight. However, DTPLI has not defined targets that clarify either the extent of rail freight mode share desired, or the nature of the environmental benefits sought.

Similarly, other actions that have potentially beneficial impacts on the environment which DTPLI has no defined outcomes or targets for are:

- promoting the use of more efficient higher productivity freight vehicles
- encouraging fleet operators to use new technologies to manage noise, emissions and improve road efficiency.

The absence of related performance indicators and targets for these initiatives means that DTPLI's effectiveness in improving the environmental performance of freight transport cannot be meaningfully evaluated.

There is also no evidence that DTPLI has proposed actions and related targets to reduce the energy consumption of freight infrastructure and transport, or which promote the use of renewable energy sources.

### 2.3.5 Regional growth plans

The state's eight RGPs do not specify how they will contribute to managing the environmental impact of the transport system, including related transport emissions or noise. While all RGPs mention the need for improved public transport services—including walking and cycling—DTPLI has not established an explicit link between these actions and measurable environmental benefits. None of the RGPs currently set targets that would allow meaningful monitoring and evaluation of how planned actions contribute to the Act's environmental sustainability objective.

DTPLI's responsibility for 'leading strategic policy' means it needs to ensure that these plans align with and support the achievement of broader statewide strategic priorities, including those relating to the environment. Currently this is not the case.

Only the Hume RGP mentions improving transport as an option for minimising environmental impacts, but it does not go into further detail. Similarly, while both Hume's and Loddon Mallee's plans recognise the need for more sustainable vehicle technologies, DTPLI has not outlined any actions it will take to encourage these technologies or to measure their environmental impact.

## 2.4 Statewide governance and monitoring arrangements

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DTPLI has established arrangements to support cross-government coordination and implementation of transport system projects and priorities. However, these do not support the coordinated and effective implementation of actions for addressing the environmental sustainability objective of the Act.

DTPLI advised that its primary arrangement for supporting effective cross-government coordination across the portfolio is the Transport Planning Group (TPG) which was formed in June 2012 and brings together executives from DTPLI, VicRoads and Public Transport Victoria. The purpose of this group is to provide ongoing advice on high-level strategic issues that impact the portfolio, integrate transport portfolio strategies and resolve differences between agencies. It is evident that TPG meetings consider progress of major strategic initiatives.

However, DTPLI confirmed that the TPG does not actively monitor progress against the transport system objectives. There is therefore no governance body across the portfolio that oversees and actively monitors progress in achieving the environmental sustainability objective of the Act.

An explicit focus of the TPG on this is warranted given that it is a legislated objective of the transport system.

## 2.4.1 DTPLI's approach to monitoring and measuring performance

DTPLI has a Transport Outcomes Framework (TOF) to support and monitor the impact of transport system actions in achieving the Act's objectives. DTPLI advised that the TOF has been used to support the development of business cases for transport projects and that it is currently being revised to better support the implementation of *Plan Melbourne* and VTFS.

Similar performance monitoring systems are expected to be developed for the RGP. However, until these monitoring frameworks are completed we are unable to assess their effectiveness in monitoring the achievement of the Act's environmental sustainability objective.

### Transport Outcomes Framework

The TOF outlines seven broad portfolio initiatives linked with reducing the impact of the transport system on the environment. These include:

- reducing the reliance on private motor cars
- increasing walking and cycling
- reducing the negative impacts of travel on the global environment
- reducing the negative impacts of travel on the local environment
- supporting a shift to more efficient modes
- increasing use of more sustainable resources for construction and operation
- minimising harm to natural systems and protect biodiversity.

Supporting the TOF is an indicators booklet that details examples of how these impacts could be measured. However, the booklet states that 'the data required for their measurement may not exist in Victoria' and the TOF is yet to be finalised. As an example of what is yet to be completed, the measurement indicators are incomplete or not yet defined for two of the seven initiatives listed above.

While it is evident the TOF has the potential to assist agencies in measuring the environmental impacts of their initiatives, the current absence of statewide targets for key TOF indicators significantly limits this.

### Further work on new monitoring and reporting arrangements

DTPLI advised that proposed changes to the TOF will provide a more comprehensive framework that will better support the monitoring of outcomes against the Act's environmental sustainability objective.

Specifically, it advised that the revised framework will:

- enable the connection between integrated outcomes and particular outputs, including environmental ones, to be measured
- allow outcomes to be monitored over time
- capture direct environmental impacts, even if they are not directly delivered by actions included in *Plan Melbourne*.

The initiatives should be complemented by public reporting against statewide targets to enable Parliament and the wider community to assess the transport system's performance in achieving the environmental sustainability objective of the Act.

These initiatives are encouraging and, if effectively delivered, are likely to have a positive effect on the environmental impacts of transport. However, they are currently at a very early stage and their effectiveness and comprehensiveness cannot be assessed.

## Recommendations

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That the Department of Transport, Planning and Local Infrastructure, in consultation with other transport agencies:

1. develops a statewide strategy that sets out clear strategic priorities and actions, with statewide objectives, targets, and performance measures to address the environmental impacts of the transport system
  2. reviews its governance arrangements and establishes mechanisms to monitor and coordinate related agency actions
  3. establishes arrangements to measure and report on the performance of the transport system and related agencies in meeting the environmental sustainability objective of the *Transport Integration Act 2010*, including improvements in greenhouse gas emissions, air quality and noise as a result of portfolio-wide strategic interventions and implemented actions.
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# 3 Managing road and public transport impacts

## At a glance

### Background

Transport agencies must develop annual or corporate plans that give effect to their obligations, support their work to manage the environmental impacts of transport and align with statewide strategic priorities and performance measures.

### Conclusion

The Department of Transport, Planning and Local Infrastructure's (DTPLI) and Public Transport Victoria's (PTV) lack of clear environmental objectives and targets means that they cannot demonstrate the comprehensiveness and effectiveness of their actions to minimise environmental impacts of transport. Of the agencies examined, VicRoads' strategic plan and reporting framework is the most comprehensive and is a model for a portfolio-wide plan.

### Findings

- DTPLI's current corporate plan does not define strategic priorities and performance measures, which would permit VicRoads and PTV to align their plans accordingly. Therefore, DTPLI cannot report on outcomes achieved.
- VicRoads' plan targets the key environmental impacts of the road system and has specific goals for reducing greenhouse gas emissions, improving air quality and minimising traffic noise impacts. VicRoads also regularly reports on progress.
- PTV has no dedicated strategy to manage public transport's environmental performance, and its public reporting of information has significantly decreased.

### Recommendations

- That DTPLI ensures the priorities and performance measures in its statewide strategy are reflected in the corporate plans.
- That VicRoads ensures its key performance indicators are outcomes focused.
- That PTV develops specific targets and performance measures to improve the environmental performance of public transport.

## 3.1 Introduction

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The *Transport Integration Act 2010* (the Act) requires transport agencies to develop a corporate plan that gives effect to their obligations under the Act and supports achievement of the transport system's objectives.

The Department of Transport, Planning and Local Infrastructure's (DTPLI) corporate plan must specify strategic priorities and performance measures for the transport system, and VicRoads and Public Transport Victoria (PTV) must align their plans with DTPLI's.

VicRoads and PTV must also develop and implement 'effective environmental policies, strategies and management systems' to minimise any adverse environmental impacts from the road and public transport system, respectively.

To be effective, these strategies need to clearly specify:

- priorities, actions and initiatives for addressing the environmental impacts of the road and public transport system
- measurable targets and associated indicators that enable effective monitoring and reporting on agencies' related performance.

This part of the report examines whether DTPLI, VicRoads and PTV are meeting their obligations to develop and report on plans to manage the environmental performance of the transport system.

## 3.2 Conclusion

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DTPLI does not have a clear corporate strategy to guide its work in improving the environmental performance of the transport system. Its current corporate plan also does not define strategic priorities and performance measures, which would permit VicRoads and PTV to align their plans accordingly. Public information on relevant indicators, such as mode share or transport energy usage, has significantly decreased over time. This has eroded transparency and accountability for performance.

VicRoads has the most advanced and comprehensive strategic plan and reporting framework for improving the environmental performance of the road system. The plan targets the main environmental impacts of the road system and has specific goals for reducing greenhouse gas emissions, improving air quality and minimising road traffic noise impacts. It is underpinned by a comprehensive mix of actions, clear priorities, desired outcomes and a regular reporting framework. This strategy and its underlying framework is a model of what should exist on a portfolio-wide basis.

PTV does not have a dedicated strategy for managing and reporting on the environmental performance of the public transport system. Although this issue was highlighted by our 2012 audit, *Public Transport Performance*, the quality and availability of publicly-reported information on the public transport system's environmental performance has actually declined.

## 3.3 DTPLI

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### 3.3.1 Corporate planning

DTPLI's most recent three-year corporate plan was developed by the former Department of Transport (DOT) in 2011. The plan indicates that the department's stated priorities to improve transport services—and associated planning to address deficiencies and future demand—are its main contribution to achieving the Act's environmental sustainability objective. However, the strategic plan provides no further detail on how these priorities will assist in meeting this objective.

DTPLI provided an updated copy of this plan for 2013–14. However, it is yet to be finalised and published publicly. The draft plan outlines several objectives for DTPLI, but these objectives still do not specifically address improving the environmental performance of the transport system. The only reference to the environment is an aspirational statement that DTPLI will 'ensure environmental sustainability considerations are incorporated into land use and urban development'.

Another objective, to 'develop higher quality transport services', seeks to increase public transport patronage and may have an indirect effect on improving the environmental performance of the transport system. However, there is no explicit mode shift component to this objective, and the suggested indicators are not sufficient to assess whether the environmental performance of the transport system has improved.

Consequently, DTPLI's corporate planning does not adequately support the effective achievement of the Act's environmental sustainability objective. Further, DTPLI's current lack of related strategic priorities and performance measures for achieving this goal means that VicRoads and PTV cannot reliably align their corporate plans accordingly, as is required by the Act.

### 3.3.2 Reporting

Information reported by DTPLI is not sufficient to assess the achievement of environmental outcomes. It has discontinued many of the related outcome measures previously reported by the former DOT. While it has continued to report on a number of output measures, these are not sufficient for assessing whether the environmental performance of the transport system has improved.

Figure 3A clearly shows the significant decline in outcome measures and targets reported by DOT and DTPLI between 2010–11 and 2012–13.

**Figure 3A**  
**Number of environment-related outcome measures and targets reported by financial year**

2010–2011 (DOT)	2011–2012 (DOT)	2012–2013 (DTPLI)
<ul style="list-style-type: none"> <li>• Public transport patronage growth</li> <li>• Reduce median trip length by mode</li> <li>• Rate of growth in public transport services compared to growth in population</li> <li>• Target of 20 per cent of personal motorised trips in Melbourne taken by public transport by 2020</li> <li>• Increase share of sustainable travel modes—weekday private trips</li> <li>• Increase bicycle path use in inner Melbourne</li> <li>• Increase car occupancy rate</li> <li>• Increase use of renewable energy in transport</li> <li>• Reduce transport greenhouse gas emissions per vehicle kilometre</li> </ul>	<ul style="list-style-type: none"> <li>• Public transport patronage growth</li> <li>• Proportion of metropolitan Melbourne trips by mode</li> </ul>	<ul style="list-style-type: none"> <li>• Public transport patronage growth</li> </ul>

Source: Victorian Auditor-General's Office from Department of Transport and Department of Transport, Planning and Local Infrastructure annual reports, 2010–11 to 2012–13.

While current reporting on public transport patronage is relevant, it is limited and not sufficient to comprehensively assess the environmental performance of the wider transport system. There is scope to better represent environmental performance—for example, by estimating the vehicle kilometres saved through changes in the mode share of public transport. The associated reduction in greenhouse gas and other air pollution could also be estimated from this data.



## 3.4 VicRoads

### 3.4.1 Strategic planning

VicRoads has the most advanced strategic planning and reporting framework of the three agencies audited. It has developed a number of strategies and systems to support achievement of the transport system's objectives, including the environmental sustainability objective.

#### *Sustainability and Climate Change Strategy 2010–2015*

VicRoads has developed a dedicated strategy to make the road system more sustainable. Positive aspects of VicRoads' *Sustainability and Climate Change Strategy 2010–2015* (SCCS) include:

- an explicit link between the strategy, VicRoads' corporate strategic direction to make the road system more sustainable and the environmental sustainability objective of the Act
- a multipronged approach that aims to:
  - improve road network efficiency
  - facilitate public transport, walking and cycling
  - reduce emissions from road construction, street and traffic lights
  - improve fuel efficiency
- key performance indicators to measure the progress of related actions, including regular annual public reporting
- clearly assigned accountabilities for specified actions to internal divisions, with regular internal oversight and reporting
- a public reporting framework through regularly updated action plans.



### Benefit Management Framework

VicRoads has also developed a *Benefit Management Framework* (BMF) as a tool to help it identify appropriate benefits and key performance indicators for projects and programs. This framework complements the Department of Treasury and Finance's *Investment Management Standard* and is designed to assist VicRoads to identify how proposed investments strategically link to the Act's objectives.

The BMF requires project teams to identify whether having a 'less carbon intensive transport network' or the 'protection of environmental values and services' are expected benefits. It then provides a series of potential indicators, measures and data sources for these benefit types, which can help to measure the project's expected impact. The potential indicators and measures are outlined in Figure 3B.

**Figure 3B**  
**Potential indicators and measures for environmental benefits**

Indicator	Measures
Public transport patronage	Number of patrons during a specified time period on either tram or bus or both on specified routes or corridors
Mode shift from car to bicycle or foot for short trips	Percentage or number of trips made by tram or bus that were previously made by car Percentage or number of trips made by bicycle or foot that were previously made by car
Carbon emissions	Number of tonnes of carbon dioxide (CO <sub>2</sub> ) or other greenhouse gases saved—calculated using vehicle kilometres travelled (VKT), carbon content in fuel and fuel efficiencies
Delays at intersections for buses and trams	Minutes of delays at intersections per kilometre travelled
Delays at intersections for vehicles	Minutes of delays at intersections per kilometre travelled
Access to public transport	Minutes of delay between origin and access points
Connectivity between different modes of transport	Distance between collection and drop-off facilities Average variability of road-based public transport travel Pedestrian travel times between modes
Net gain offsets	Acres of roadside strips planted
Air quality	Vehicle emissions by gas type

Source: Victorian Auditor-General's Office from VicRoads *Benefit Management Framework*.

Importantly, the BMF requires the development of baseline measures and targets for each measure. Teams must also identify potential 'disbenefits', or negative impacts, that could occur from VicRoads' projects. The range of possible 'disbenefits' includes the emission of greenhouse gases, and teams must assess the level and likelihood of such impacts. Further, prior to project commencement, the BMF also requires the establishment of reporting requirements, including time lines for reporting.

This demonstrates that VicRoads has a sound and transparent approach for assessing how potential investments will contribute to the environmental sustainability objective of the Act. Identifying objectives and setting benchmarks, measures and targets also assists in laying the foundations for effective outcome monitoring and project evaluation.

### 3.4.2 Reporting

#### *Sustainability and Climate Change Strategy 2010–2015 progress reports*

VicRoads has committed to monitoring and publicly reporting on the achievements of its SCCS. To date, it has released three progress reports for 2011, 2012 and 2013. This is an encouraging initiative that promotes VicRoads' accountabilities for the actions and initiatives designed to meet its obligations under the Act.

The strategy could be improved by further developing key performance indicators (KPI) to measure the impact of related actions on environmental outcomes. For example, a key action under the strategy is to promote public transport mode share as a way to reduce the amount of greenhouse gas emissions from Victoria's road network. The related KPI measures the number of projects implemented, and while this is appropriate for measuring output, it does not measure the impact of this action on achieving the objective of the strategy.

Further, while VicRoads has developed measures such as travel time, reliability, traffic flow and/or patronage to assess the effectiveness of related tram and bus priority programs, there is scope to better measure the environmental performance of the action. For example, by estimating vehicle kilometres saved through changes in public transport use, VicRoads could estimate the extent of reduced greenhouse gas emissions.

#### *Internal monitoring of greenhouse gas abatement*

VicRoads estimates that effective implementation of its strategy will deliver around 173 000 tonnes of greenhouse gas savings by 2014–15. This is the equivalent of the average energy consumption of around 13 000 households.

VicRoads actively monitors the emissions abatement achieved by actions implemented under the SCCS. Figure 3C shows that VicRoads is currently on track to exceed the total expected greenhouse gas abatement from the SCCS.

**Figure 3C**  
**Monitored greenhouse gas emissions reduction in tonnes of CO<sub>2</sub> equivalents**

Abatement	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	Total
Target	15 175	19 162	26 434	36 644	37 502	38 328	173 245
Actual	(a)	23 640	40 029	23 325	71 526	(b)	158 520

(a) Data not recorded.

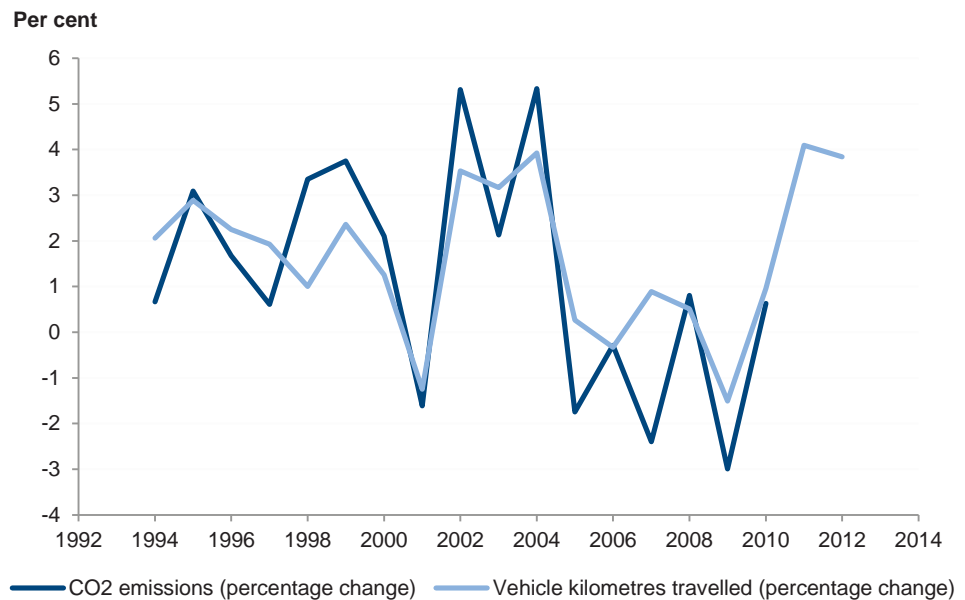
(b) Data not yet available.

Source: Victorian Auditor General's Office from data supplied by VicRoads.

### Information available through annual reports

VicRoads' 2012–13 annual report describes performance against its strategic directions, including in 'making the road system more environmentally sustainable'. A key metric reported on in the annual report is the increase in vehicle CO<sub>2</sub> emissions compared with the increase in VKT, shown in Figure 3D.

**Figure 3D**  
**Victorian vehicle CO<sub>2</sub> emissions compared with VKT**



Source: Victorian Auditor-General's Office from data supplied by VicRoads.

Figure 3D shows that emissions growth was generally higher than travel growth between 1994 and 2004, but has been trending below or at travel growth for five years from 2005 to 2010, indicating a per VKT reduction in CO<sub>2</sub> emissions during that time. VicRoads intends to simplify this KPI in the next annual report by reporting on grams of greenhouse gas emissions per VKT.

### 3.4.3 New strategy and improved monitoring and reporting

VicRoads advised that it is currently developing a new five-year strategy for managing the environmental impacts of the road system along with new strategic directions and corporate KPIs.

VicRoads intends for the new five-year strategy, the Sustainability and Climate Change Strategy 2015–2020, to deliver more comprehensive and meaningful performance indicators. Specifically, it advised that these will measure improvements in greenhouse gas emissions, air quality and noise as a result of strategic interventions and implemented actions.

Additionally, VicRoads advised that the corporate KPIs will seek to ensure that evaluation of the environmental performance of the road system is not just ‘bottom up’ but also ‘top down’ by aiming to achieve certain strategic outcomes.

This work is encouraging but currently at a very early stage and its effectiveness cannot be assessed.

## 3.5 PTV

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### 3.5.1 Previous VAGO audit, *Public Transport Performance*

Our 2012 audit, *Public Transport Performance*, identified a number of shortcomings in the former DOT’s approach to managing and reporting on the public transport system’s environmental performance.

While the audit was of the former DOT, PTV has made little progress to date on:

- better measuring and reporting on outcomes—for example, by estimating kilometres travelled by different modes and, in particular, the vehicle kilometres saved through changes in public transport use
- finalising the Victorian Public Transport Energy Consumption and Greenhouse Gas Emissions report and documenting a costed, timed implementation plan.

Indeed, this audit has found that PTV’s performance has worsened since our previous *Public Transport Performance* audit. Specifically, relevant performance information previously publicly available through its annual reports has actually declined, which is explained later in this Part.

Additionally, at the commencement of this audit, relevant PTV officers were unaware of the former DOT's draft report on how to improve public transport's energy consumption and greenhouse gas emissions and confirmed that no further action had been undertaken since the end of our previous audit. It also advised that limited progress has been made in implementing our previous report's recommendation, as outlined in Part 4 of this report.

## 3.5.2 Current strategic planning

### PTV's 2013–14 corporate plan

PTV's current strategic planning approach does not support achievement of its environmental sustainability obligations under the Act. Its 2013–14 corporate plan identifies 'safety and environment' as a priority, but all related strategies and performance measures in the plan reference safety issues only and not the environment.

The lack of related environmental actions, outcomes and performance measures means that PTV cannot be assured that it is adequately fulfilling its obligation to contribute to improving the environmental performance of public transport.

### Network-level strategic planning

PTV is responsible for planning the public transport network as part of an integrated transport system consistent with the strategic policies and plans of DTPLI.

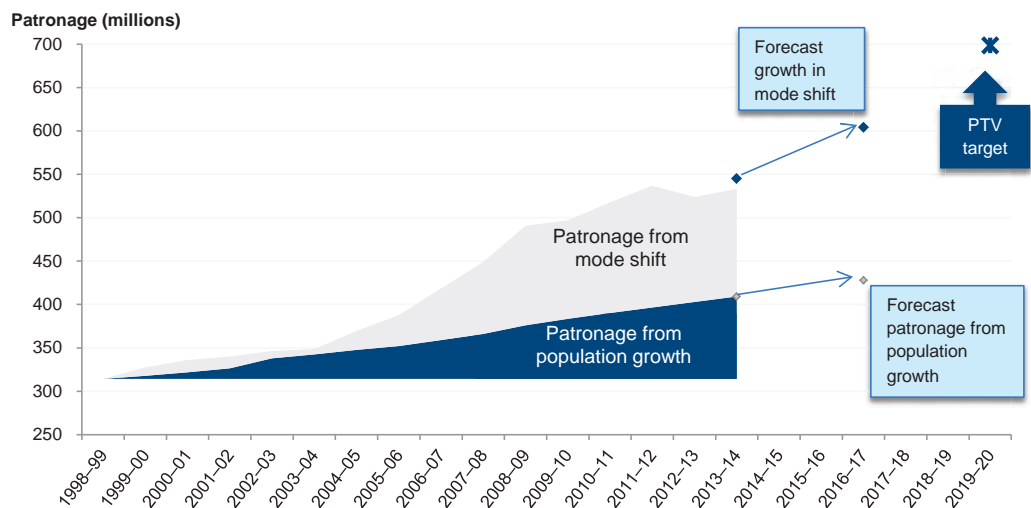
It advised that its network development plans take into account the causes of the public transport system's environmental impacts and the best ways to address them. These plans include the:

- **Network Development Plan—Metropolitan Rail**—PTV's first step in defining the future needs for public transport across metropolitan Melbourne. This plan has established a basis for future planning and development of the state's metropolitan railway network to meet needs over the next 20 years and beyond.
- **Draft Multi-Modal Coordination Policy and Strategy**—supports the consistent and integrated development of network development plans. The policy covers all Victorian public transport modes, however, the initial phase is targeted towards improving bus–train and tram–train connections in metropolitan Melbourne.
- **Draft Network Development Plan—On Road Public Transport**—focuses on improving metropolitan bus and tram connections, reflecting PTV's integrated approach to service planning.
- **Draft Network Development Plan—Regional Public Transport**—focuses on connections between regional trains, buses and coaches.

As at August 2014, only the December 2012 *Network Development Plan—Metropolitan Rail* is completed. A key goal of the plan is to increase the patronage of the rail system, and PTV forecasts that annual patronage across train, tram and bus services will grow from 517 million trips in 2010–11 to 700 million trips by 2020 and more than one billion trips in 2031.

While this is not an explicit mode shift target, PTV advised that achieving this will require not only the public transport system to keep pace with population growth but also attracting new users through mode shift from cars. Figure 3E highlights the scale of the mode shift challenge envisaged by PTV.

**Figure 3E**  
**Annual public transport patronage and population growth**



Source: Victorian Auditor-General's Office from data supplied by Public Transport Victoria.

The plan aims to improve multi-modal services that will encourage passengers to use buses instead of private cars to access the rail network.

The draft Multi-Modal Coordination Policy and Strategy establishes a multi-modal service coordination framework to guide service design elements such as scheduling and network development planning. The policy recognises the relationship between better provision of multi-modal journeys and the potential to attract new public transport passengers, especially in using buses to access the train network. However, the policy does not contain any explicit goal to boost public transport mode share or effect mode shift from cars as a means to reduce pollution from the transport sector.

The Network Development Plan—On Road Public Transport is also currently in draft form but acknowledges there is considerable scope to increase the contribution of public transport to reducing pollution from the transport sector—especially by attracting mode shift from cars to public transport.

PTV advised that it developed the Network Development Plan—On Road Public Transport taking into account the mode shift growth objective set out in Figure 3E, including concepts in the draft Multi-Modal Coordination Policy and Strategy. The plan outlines strategies to improve services so that they provide a practical and attractive alternative to cars, especially in growth areas. Key strategies include:

- more frequent and direct routes for buses, including implementing local neighbourhood buses to fill the gaps in the premium network
- increasing the reliability and capacity of public transport
- improving inter-modal coordination to provide seamless interchange opportunities
- longer operating hours.

The Network Development Plan—On Road Public Transport also identifies strategies for improving the energy usage and associated pollution produced by public transport. These include:

- ensuring the most efficient operation of trams and buses by providing appropriate road space priority and by ensuring that adjacent land uses do not negatively impact on efficiency
- assessing environmental outcomes of project options, cost-benefit analyses for new projects and network-wide assessments of the performance of public transport.

However, it does not set relevant targets for improving the energy usage and associated pollution of public transport. This means that the effectiveness of related strategies cannot be transparently assessed.

Further work is required to finalise the Network Development Plan—Regional Public Transport. Until it is finalised its implications for future environmental initiatives cannot be determined. These plans once completed are also expected to further inform the development of related actions for regional public transport.

### *Network Planning Division*

PTV undertook economic evaluations during the development of bus networks proposed under the draft Network Development Plan—On Road Public Transport, which considered the reduced air, water and noise pollution attributable to saved car trips.

However, in determining total benefits, the model does not currently take into account the costs of air and noise pollution generated by public transport. PTV advised it is working to address this.

### Reporting on public transport's environmental performance

Compared to 2012 when we did our audit, *Public Transport Performance*, there is now less publicly available information on public transport's contribution to the Act's environmental sustainability objective. The former DOT's 2010–11 and 2011–12 business plans included indicators measuring the reduction in carbon emissions per passenger kilometre, and emissions avoided due to increased public transport usage. However, these are not reported in PTV's current business plans.



Further, the former DOT's 2010 corporate plan included two indicators of mode share, which provided a relevant, albeit partial indicator of its contribution to more sustainable travel. These indicators measured weekday private trips by sustainable travel mode—public transport, walking or cycling—and the volume of freight on rail. However, they are also not in PTV's current corporate plan and are not reported on.

### 3.5.3 New approach to strategic planning and reporting

During the course of this audit, PTV advised that it is:

- developing a new corporate plan that incorporates strategic mode share and mode shift objectives
- improving methods for monitoring and reporting on the outcomes of individual initiatives to guide and evaluate its future work priorities.

#### Developing the 2014–15 corporate plan

PTV acknowledges the shortcomings of its previous plans and advises that its new corporate strategic planning process is redefining the organisation's vision, strategy and priorities.

Key actions in the plan that are expected to contribute either 'moderately' or 'majorly' to improving the environmental performance of the public transport system include:

- delivering on-road priority for public transport by partnering with VicRoads and local government
- integrating land-use and transport planning with a public transport perspective
- redesigning bus networks to deliver the greatest level of patronage growth
- ensuring that planning for key infrastructure projects, such as the Melbourne Rail Link, maximise their benefits for customers
- delivering new trains and trams to meet growing patronage needs.

While these initiatives are encouraging, PTV has not quantified how they will contribute to the environmental sustainability objective of the Act, or evaluated their effectiveness relative to statewide and corporate targets.

Similar to PTV's current 2013–14 corporate plan, the new corporate plan has a strategic goal to improve 'safety and environment' but does not contain any specific environment-related actions. It instead expresses an aspirational statement to 'reduce the environmental footprint of public transport through standards, partnerships and new infrastructure'.

PTV advised that specific initiatives will be developed through its business planning process. In doing so, PTV needs to develop comprehensive actions, targets and performance measures to support achievement of these goals and address the shortcomings identified by this audit and our previous 2012 audit of *Public Transport Performance*.

## Evaluating individual projects

PTV has recently made some progress in evaluating the outcomes of individual projects, which now all include an estimation of the number of car trips converted to public transport as a result of the project.

A recent example is the new William's Landing railway station project, where a post-implementation review estimated that around two-thirds of 2 000 people using the new station to reach the city in the first six months had previously used their cars—creating a reduction in the number of cars travelling to the city each day. It also found that associated improvements in the bus network meant that 34 per cent of train passengers are travelling to the new station by bus. This is significantly higher than the 9 per cent average for bus access across the rest of the train network.



*Williams Landing railway station.*

While estimating trips converted to public transport is a positive step forward, PTV could further leverage this information by estimating the vehicle kilometres and greenhouse gas and other emissions saved relative to defined targets.

## 3.6 Transport for London's approach to reporting

Transport for London's (TfL) approach to reporting on environmental management is an example of good practice in setting targets, monitoring, and reporting on environmental outcomes. It allows Parliament and the general public to quickly assess how well it is performing in relation to clearly established targets relating to emissions reduction, air quality and waste recycling.

Each business unit within TfL reports internally on progress against these targets on a quarterly basis. TfL then reports publicly on progress against these targets annually.

Figure 3F summarises the reported performance against these established targets for 2012–13.

**Figure 3F**  
**Transport for London’s health, safety and environmental reporting 2012–13**

Environmental objective	Target	Current status
Normalised carbon emissions per passenger per kilometre	A 20 per cent reduction by 2017–18 based on 2005–06 levels	Achieved 2012–13, three years early
Nitrogen oxide emissions	A 40 per cent reduction by 2017–18 based on 2005–06 levels	Reduced by 11 per cent in 2012–13
Particulate matter 10 emissions	A 50 per cent reduction by 2017–18 based on 2005–06 levels	Reduced by 26 per cent in 2012–13
Waste recycling	Recycle 70 per cent of commercial and industrial waste	At 69 per cent recycled in 2012–13
	Re-use and recycle 90 per cent of construction, demolition and excavation waste	Achieved 2011–12, four years early with 98 per cent recycled or re-used

Source: Victorian Auditor-General’s Office from Transport for London’s *Health, Safety and Environment report 2012/13*.

## Recommendations

4. That the Department of Transport, Planning and Local Infrastructure ensures that the priorities and performance measures contained in the proposed statewide strategy are reflected in the department’s and relevant portfolio agencies’ corporate plans.
5. That VicRoads ensures that key performance indicators developed under its new five-year strategy and corporate plan are outcomes focused to measure the impact of related actions on the environment.

That Public Transport Victoria:

6. develops specific actions, targets and related performance measures to support achievement of defined statewide priorities for improving the environmental performance of the public transport system, and publicly reports on its related performance against these measures each year
7. systematically evaluates the environmental outcomes of major investments in public transport including, where relevant, by estimating the vehicle kilometres saved and the associated reduction in greenhouse gas and other emissions relative to defined targets.



# 4 Impacts of recent agency initiatives

## At a glance

### Background

Effective management of the environmental impacts of transport requires multiple approaches—including initiatives to reduce the demand for travel, increase the use of sustainable modes, leverage new technologies, make transport activity and infrastructure more resource efficient, and manage transport noise.

### Conclusion

While the Department of Transport, Planning and Local Infrastructure (DTPLI) and Public Transport Victoria (PTV) have undertaken some limited initiatives, they are not supported by a coherent framework and cannot be reliably assessed. In contrast, VicRoads has undertaken a variety of coordinated actions and initiatives, which have demonstrably improved the environmental performance of the road network.

### Findings

- DTPLI's initiatives have potential environmental benefits. However, DTPLI should investigate how these could be more systematically applied across the network.
- VicRoads is systematically addressing the key environmental impacts of the road system and can demonstrate positive outcomes to date.
- PTV has made little progress in improving public transport's environmental performance. It is undertaking a limited number of actions to improve energy consumption but could more systematically drive and evaluate improvements.

### Recommendations

- That DTPLI investigates opportunities for applying any insights from the FleetWise and electric vehicle trials.
- That VicRoads develops arrangements to monitor and report on the environmental impact of initiatives to improve mode shift and traffic flow.
- That PTV addresses the recommendations from the former Department of Transport's 2011 draft report and investigates the costs and benefits of sourcing electricity from renewable sources.

## 4.1 Introduction

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It is important to recognise that agencies manage the transport system to implement a range of legislative and policy objectives that must be balanced with the goal of contributing to environmental sustainability. The *Transport Integration Act 2010* (the Act) establishes an imperative for the transport agencies to minimise the environmental impacts of transport.

Effectively managing the environmental impacts of transport requires multiple approaches, including initiatives, where relevant, that:

- reduce the demand for travel, particularly through influencing behavioural change
- increase the use of public transport, walking and cycling
- leverage new technologies to minimise transport-related greenhouse gas emissions
- make transport activity and infrastructure more resource efficient by reducing energy consumption and related emissions.
- manage transport noise.

This part of the report examines whether the Department of Transport, Planning and Local Infrastructure (DTPLI), VicRoads and Public Transport Victoria (PTV) are improving the environmental performance of the transport system.

## 4.2 Conclusion

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DTPLI has undertaken some initiatives designed to improve the environmental performance of transport, such as conducting an electric vehicle trial and a trial to improve the energy efficiency of light vehicle fleets. However, as noted in Part 3 of this report, the impact of these initiatives cannot be reliably assessed as they are not supported by a coherent framework for coordinating, monitoring and reporting on their performance in achieving the environmental sustainability objective of the Act.

VicRoads has undertaken a variety of coordinated actions and initiatives to improve the environmental performance of the road network. These have resulted in positive environmental outcomes, including:

- reduced travel times of buses and trams
- reduced noise exposure
- decreased carbon emissions from road construction, operation, and maintenance.

Through its *SmartRoads* framework VicRoads' prioritises sustainable transport on the road network. However, there is insufficient performance information to assess the extent to which *SmartRoads* has led to mode-shift and improved environmental outcomes.

PTV is undertaking relevant initiatives for improving the environmental performance of the public transport system. However, it is currently doing so without a clear framework for coordinating, monitoring and reporting progress towards explicit environmental goals. Consequently, it has paid insufficient attention to date to addressing the environmental impacts of the public transport system. However, PTV recognises that it could do more to reduce the energy consumption of public transport and has commenced positive initiatives to improve the fuel efficiency of buses and to measure the carbon dioxide (CO<sub>2</sub>) emissions of public transport services.

## 4.3 DTPLI initiatives to improve environmental performance

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DTPLI acknowledges that sustainable transport is not just about encouraging people to use public transport, but is also about reducing carbon emissions on all transport modes across Victoria's transport system. It is undertaking a number of initiatives to move towards a more sustainable transport system by focusing on three major areas:

- shaping a more efficient city, where people live closer to their work, schools, services and shops, as discussed in Part 2
- making it easier for people to use more sustainable forms of transport
- improving the environmental performance of the transport fleet.

However, performance information collected and reported for most of these initiatives is currently very limited. This means that DTPLI cannot verify that it is effectively and efficiently addressing the environmental impacts of transport.

DTPLI's Victorian FleetWise program is an example of an encouraging initiative designed to engage private and public sector organisations to assist them to improve the energy efficiency of their light vehicle fleet. Similarly, research commissioned by DTPLI as part of the electric vehicle trial shows there is a role for government in supporting the uptake in Victoria of these vehicles, which have significant environmental benefits.

DTPLI should investigate opportunities for applying any insights from the FleetWise and electric vehicle trials across the broader transport system.

### 4.3.1 Improving environmental efficiency of transport fleets

#### FleetWise

FleetWise is a DTPLI program designed to help public and private sector organisations improve the fuel efficiency of their vehicle fleets through:

- understanding their fleet profile and energy use
- finding practical strategies to improve fleet efficiency
- implementing, measuring and refining a fleet management plan for their organisation.

Figure 4A shows that, among other positive outcomes, the one-year pilot program with 12 light commercial vehicle fleets resulted in a 5 per cent reduction in average greenhouse gas emissions and a 2 per cent improvement in air quality.

**Figure 4A**  
**Outcome indicators for the FleetWise pilot program**

Performance measure	Aggregated change
Air quality score	+0.12 (2 per cent improvement)
Total greenhouse gas emissions	-297 tonnes (3 per cent improvement)
Average greenhouse gas intensity	-12.2g CO <sub>2</sub> equivalents/km (5 per cent improvement)
Total kilometres	+968 121km (3 per cent increase)
Total vehicles	-94 (6 per cent reduction)

Source: Victorian Auditor-General's Office from information supplied by the Department of Transport, Planning and Local Infrastructure.

DTPLI advised that it is currently working to finalise the Victorian FleetWise program and to make outputs and lessons learnt from the pilot available.

## 4.3.2 Understanding new vehicle technologies

### Electric vehicle trial

The electric vehicle trial is an initiative that was started by the former Department of Transport (DOT) to foster and develop a market for electric vehicles in Victoria. The trial is designed to help understand the process, time lines and barriers for transitioning to electric vehicle technologies in Victoria. Its aim is to promote and increase the uptake of electric vehicle technology, which is expected to result in better environmental outcomes for the transport system.

The trial ended in July 2014, with the final report expected in August 2014. However, the mid-term report has been available since December 2012. In terms of environmental benefits, the mid-term report found that:

- if run on renewable energy, an electric vehicle may provide a net benefit in terms of life cycle carbon emissions within three years of operation and a saving of over 50 per cent across the 20-year average Victorian vehicle lifetime
- even without full operation on renewable energy, the advantages of electric vehicles over petrol engine vehicles is evident, particularly in 'stop-start' traffic conditions.

It also noted the technical and institutional barriers to encouraging new technology adoption that need to be overcome. These barriers include cost, performance, regulations, lack of information and cultural values.



The mid-term report showed a potential role for DTPLI in the development of Victoria's electric vehicle market. Towards the end of the audit, DTPLI supplied more recent research it commissioned in 2014 that suggests a limited role for government to promote these vehicles, such as through:

- encouraging government fleets and commercial fleets to include a mix of electric vehicles, which will increase competition amongst manufacturers to compete for this business
- coordinating forums involving public and private stakeholders to encourage partnerships
- playing a key role in communicating the benefits to the public
- reducing or eliminating annual registration costs, or other costs such as parking or road tolls for users of electric vehicles
- helping to build charging infrastructure.

DTPLI should investigate opportunities to apply these insights across the broader transport system.

### 4.3.3 Boosting active transport modes

#### *Cycling into the Future 2013–23*

The Victorian Government's cycling strategy, *Cycling into the Future 2013–23*, aims to 'grow' cycling in Victoria, but does not set a specific target for the increase. It recognises that cycling can contribute to a healthier environment by helping to reduce air pollution, noise and greenhouse gas emissions. The strategy cites analysis that suggests that a 20 per cent mode shift from cars would result in reduced air pollution and emissions for an annual economic benefit of \$33 million.

DTPLI established an Interdepartmental Cycling Committee (ICC) to coordinate, monitor and report on progress in implementing the strategy. The strategy's action plan states that implementation will be 'monitored by assessing progress against the indicators and measures set out in the strategy.' Over the past year and a half, the ICC has met five times to discuss progress and issues relating to implementation.

While this is positive, the absence of any clear targets means that the effectiveness of actions at improving environmental outcomes cannot be transparently assessed.

## 4.4 Initiatives to manage the environmental impacts of the road system

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The Act specifically requires VicRoads to manage the road system in a way that supports a sustainable Victoria by seeking to:

- increase the share of public transport, walking and cycling trips as a proportion of all transport trips in Victoria
- improve the environmental performance and minimise the adverse environmental impacts of the road system.

VicRoads has identified a comprehensive mix of coordinated actions and initiatives to address these obligations under its *Sustainability and Climate Change Strategy 2010–2015* (SCCS) and related action plans. These are outlined below.

#### 4.4.1 Managing the road network to increase the use of sustainable transport modes

##### *SmartRoads*

VicRoads' SCCS highlights the potential for its *SmartRoads* initiative to reduce greenhouse gas emissions from the road system by prioritising low emissions transport modes. Specifically, *SmartRoads* provides a principle-based decision-making framework to improve the efficiency of the road network by:

- making trade-offs between congested traffic streams by assigning priority to different modes according to the place and the particular time of the day
- laying the foundations for maximising person throughput by prioritising the movement and use of high capacity vehicles, such as public transport
- encouraging more efficient trip making by choice of route, type of vehicle and time of travel.

By prioritising and thus encouraging more sustainable travel modes, *SmartRoads* helps to reduce the environmental impacts of the road system. VicRoads uses *SmartRoads* to assess all new road proposals, major and minor infrastructure works, and land-use developments that affect the road network. Additionally, VicRoads' SCCS signals that it intends to continue the rollout of *SmartRoads* and extend it to relevant regional areas.

While *SmartRoads* can promote the use of low-emissions transport by prioritising public and active transport where appropriate, there is no specific performance information available to show whether it has led to mode-shift or more efficient travel. This information would assist VicRoads to monitor and improve the environmental performance of the road network.

##### Tram and Bus Priority Program

The Tram and Bus Priority Program is one of the initiatives undertaken by VicRoads to promote the use of public transport. The program seeks to improve the efficiency and reliability of trams and buses by improving the availability of road space through clearways and dedicated bus lanes. These initiatives are included under SCCS as a way to reduce greenhouse gas emissions from the road system by improving the efficiency of road-based public transport with the aim of reducing car usage, congestion and emissions.

In 2013, VicRoads reviewed the Tram and Bus Priority Program and found that, for the six tram improvement projects evaluated, all resulted in reduced travel times in both the AM and PM peak periods. For bus projects, the review found that traffic signal priority and dedicated lanes for buses led to improvements in bus travel times and reliability.



Existing performance information does not permit a more comprehensive assessment of the environmental performance of the program, such as the extent to which initiatives have led to mode-shift from cars, improved public transport patronage and less greenhouse gas emissions. Consequently, while the average number of tram and bus boardings in Melbourne has been increasing since 2008–09, it is difficult to determine what proportion, if any, of this increase can be attributed to the Tram and Bus Priority Program.

#### 4.4.2 Minimising the environmental impacts of the road system

The following section outlines other VicRoads initiatives to address the environmental impacts from the road system.

##### Increasing efficiency of the existing transport network

Smoother traffic flows generally produce significantly less emissions than congested, stop-start traffic over the same distance. VicRoads is working on increasing the efficiency and integration of the existing transport network through providing increased real-time traffic information and the introduction of freeway management systems on key routes.

In particular, VicRoads' SCCS notes that an increase in the number of managed freeways in Victoria will reduce emissions and greenhouse gases for freeway travel, particularly on a per-vehicle basis due to smoother and more efficient travel. However, VicRoads has not yet assessed or set targets for the quantum of environmental benefits envisaged from this initiative.

##### Reducing greenhouse gas emissions from VicRoads' operations

A key focus of the SCCS is to reduce greenhouse gas emissions by effecting a switch to energy efficient traffic signals and street lighting and implementing renewable energy options.

VicRoads has been the leader in this in Australia and it has also measured the related outcomes of specific projects. For example, VicRoads:

- was the first road agency outside of Europe to introduce solar panels on noise walls—these panels, installed at the Tullamarine-Calder Interchange, are currently generating 21 600 kWh of electricity per year, and altogether VicRoads generates around 112 MWh a year in renewable energy
- implemented the LED traffic signal retrofit under the Greener Government Buildings Program between 2010 and 2012—this retrofit was estimated by VicRoads to deliver approximately 11 241 tonnes of CO<sub>2</sub> equivalent savings in greenhouse gas emissions a year.

VicRoads has also developed a Renewable Energy Framework to complement its SCCS. While the framework does not define specific outcomes, it has a general aspirational target to increase renewable energy sources within the road network. VicRoads advised that it monitors progress by measuring the energy consumption of electrical assets and the extent to which they are supported by renewable energy sources.

### Reducing greenhouse gas emissions from road construction

VicRoads has also actively worked to understand and mitigate the greenhouse gas impacts of its road construction activity.

#### *Minimising whole-of-life greenhouse gas emissions of road construction*

VicRoads' Carbon Gauge tool is used to calculate the whole-of-life greenhouse gas emissions impact of road construction, operation and maintenance activities. It is a publically available tool developed by VicRoads in conjunction with other road agencies in Australia and New Zealand. VicRoads has used the tool to review the greenhouse gas impacts of a number of major projects to date.

The tool was trialled in the construction of the Nagambie Bypass and demonstrated that environmentally sustainable construction initiatives have resulted in an estimated saving of over 2 000 tonnes of CO<sub>2</sub> emissions over 50 years. The tool also estimated a further savings from improved travel times of 1 221 000 tonnes in net emissions over the 50 years. A 2013 review of the project recommended broader use of the tool to assess the value and effectiveness of carbon reduction treatments for other road projects.

#### *Investing in environmentally sustainable road projects*

In 2011–12 VicRoads implemented the Integrated VicRoads Environmental Sustainability Tool (INVEST) to rate the environmental sustainability of road projects in Victoria. The aim of INVEST is to drive innovative environmental outcomes for new projects and promote the triple bottom line approach to road construction. The star ratings within INVEST are on a 'pick and choose' basis which provides companies with the flexibility to choose which environmental issues they address and which initiatives they undertake.

While the program is not specifically designed to reduce greenhouse gas emissions, this may occur as a by-product of some of the initiatives.

### Managing traffic noise

Traffic noise is managed in accordance with VicRoads' Traffic Noise Reduction Policy. The policy imposes noise limits for new and upgraded roads and includes a noise abatement program to retrofit barriers on existing roads that exceed noise limits, subject to the availability of funding.

It is important to note that individual vehicle noise standards are governed by the Australian Design Rules. However, VicRoads undertakes a variety of initiatives to manage noise from the road network, including pavement trials, barrier trials and lobbying the Commonwealth for stronger noise standards for truck engine brakes. It also collects data on noise levels to determine locations that require barriers, and conducts tests after construction to determine whether they are successfully reducing noise levels.

The 2008 *Victorian Transport Plan* provided \$100 million over 12 years to build noise barriers along freeways. VicRoads advised that funding has since been discontinued, limiting its ability to reduce traffic noise. For 2014–15, the government is providing \$3 000 in funding for the noise wall program in metropolitan areas.

## 4.5 Initiatives to manage the environmental impacts of the public transport system

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Under the Act, PTV must manage the public transport system in a way that supports a sustainable Victoria by seeking to:

- increase the share of public transport trips as a proportion of all transport trips in Victoria, including as an alternative to travelling by motor car
- improve the environmental performance and minimise the adverse environmental impacts of the public transport system.

PTV is developing a marketing campaign designed to increase the number of people using public transport, including through effecting mode shift from cars. This has the potential to benefit the environment, however, the extent to which it is driven by environmental outcomes or seeks to achieve reduced emissions from the transport system has not been demonstrated.

PTV has made little progress in implementing recommendations of the former DOT's draft Victorian Public Transport Energy Consumption and Greenhouse Emissions report. While it has made some progress on a few initiatives, PTV's current draft strategic operating plans for trains and trams do not include provisions that relate to energy consumption or emissions. However, its franchise agreement with bus operator Transdev contains a limited incentive to reduce fuel usage.

### 4.5.1 Increasing the share of public transport trips

PTV's Marketing and Product Development Division is currently planning a number of research actions and marketing campaigns to increase the mode share of public transport. These aim to help PTV to understand the barriers to using public transport by car users and to develop customer strategies to target segments of the community most likely to shift from car use to public transport.

While these actions aim to increase mode share by understanding and overcoming barriers to usage for key segments of the market, there is no evidence to show that they are driven by explicit environmental outcomes, or seek to achieve goals to reduce emissions from the public transport system.

## 4.5.2 Improving the energy consumption and environmental performance of public transport

The former DOT prepared the draft Victorian Public Transport Energy Consumption and Greenhouse Emissions report in recognition of its requirement to improve the environmental performance of the public transport system under the Act. The report highlighted that encouraging people to transfer from private to public travel is a way of reducing transport emissions, but also that public transport itself is a major energy consumer and polluter.

The report highlighted that Metro Trains, V/Line and a small number of major bus companies consume sufficient energy to require them to regularly report consumption and emissions to the Commonwealth under the *National Greenhouse and Energy Reporting Act 2007* (NGER). NGER reports show that Metro Trains and V/Line are among the top 85 energy consuming corporations in Victoria.

The report was the first attempt by the former DOT to:

- identify both the quantum of public transport energy use and greenhouse gas emissions in Victoria, and trends in these statistics in recent years
- review the principal drivers of those trends and provide a perspective on likely trends in the next few years
- summarise energy initiatives
- establish a reproducible process for annual updates to energy and emission statistics.

It made seven recommendations to improve measurement and to increase the focus, understanding and cohesion in the former DOT's approach to energy and emissions from public transport. The recommendations were that:

- strategic operations plans (SOP) be required to address the impacts of public transport operations and any current activities, such as rolling stock acquisition, on energy and emissions
- operators be required to provide annual energy plans which identify and quantify energy/emissions improvement options for consideration
- an investigation be undertaken into ways in which fuel usage statistics can best be collected from bus operators with a view to capturing this data annually for at least all of the major Melbourne and regional bus route operations
- a better understanding be acquired of the relative efficiency—energy consumption—of modern versus old rolling stock, and the reasons behind any differences, so that the impact of progressively changing fleet compositions can be better understood and considered
- operators provide, where practicable, total actual vehicle kilometres travelled (VKT) annually

- operators of interstate train services be required to provide service kilometre data and energy used per kilometre and, subject to discussion on practicality, diesel fuel consumed for those services
- all operators be required to provide the former DOT with any NGER reports made to the Commonwealth—currently only suburban train and tram operators do so through a requirement under their franchise agreements.

While there has been little progress in implementing the recommendations of the report, PTV advised that it has progressed a number of initiatives to improve the energy consumption of public transport. These are:

- Metro Trains, Yarra Trams and bus operators provide total actual VKT annually to PTV. PTV advised that VKT information currently informs rolling stock maintenance and initiatives to improve service frequency to meet demand. Efficient use of tram capacity to meet demand contributes to improved energy efficiency per passenger kilometre.
- Rail and tram operators provide PTV with NGER reports. However, this was identified by the draft Victorian Public Transport Energy Consumption and Greenhouse Emissions report as already occurring due to requirements under their franchise agreements.
- Bus operator Transdev, currently providing 30 per cent of metropolitan bus services, is obligated under the franchise agreement to run a program focused on teaching more fuel-efficient driving techniques to all drivers. However, PTV has not provided any information regarding the environmental outcomes it is seeking from this program. When the program was first introduced to Veolia Transport NSW in 2009, there was a 9.8 per cent reduction in fuel consumption.
- PTV has commenced developing performance indicators for measuring CO<sub>2</sub> emissions for public transport, and arrangements for obtaining data to provide stable benchmarks.

The draft Victorian Public Transport Energy Consumption and Greenhouse Emissions report specifically identified that sourcing energy from renewable sources presents a significant opportunity for emissions reduction. However, PTV has not further investigated the potential costs and benefits of sourcing renewable energy.

### Managing public transport operators

PTV oversees public transport operators who are responsible for the day-to-day operation of services under the existing franchise agreements with train, tram and bus operators. These agreements currently contain only limited or no direct financial incentives for operators to reduce energy consumption and emissions.

Specifically, the 2013–14 SOPs for train and tram operators do not have requirements that relate to energy consumption or emissions. This is a missed opportunity to utilise the SOPs to address the impacts of public transport operations on energy and emissions as recommended by the draft Victorian Public Transport Energy Consumption and Greenhouse Emissions report.

However, PTV advised that it reviews Metro Trains' and Yarra Trams' environmental management plans (EMP) to ensure targets are clear and agreed initiatives are being delivered. Metro's EMP has a target to achieve a 10 per cent reduction in kWh per train kilometre and a 10 per cent decrease in emissions by 2017 from its 2010–11 NGER baseline. Metro provide monthly reports on kWh per train kilometre for PTV to track its progress against the reduction target.

Bus operators are paid on a largely costs-incurred basis and therefore have little incentive to reduce their costs—although they would need to explain any significant increase in their fuel bills. However, PTV advised that Transdev's fuel payments are calculated based on yearly assumptions of fuel price and volume and that this creates an indirect financial incentive for it to use less fuel than expected. It would also have to pay extra if actual fuel consumption was higher than the fuel payments under the contract.

Further, bus operators are not required to provide PTV with NGER reports and PTV has never received this information. If bus operators were required to introduce initiatives to reduce fuel use and therefore costs, PTV would gain the benefit through reduced payments to those operators. Similarly, V/Line's agreement with the state does not incorporate energy or emissions provisions.

## Recommendations

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8. That the Department of Transport, Planning and Local Infrastructure publicly reports on the outcomes of the FleetWise and electric vehicle trials, and investigates related opportunities for applying any insights to further improve the environmental performance of the transport system.
9. That VicRoads develops arrangements to monitor and report on the environmental impacts of its initiatives to improve traffic flow and the mode share of public transport.

That Public Transport Victoria:

10. addresses all recommendations from the former Department of Transport's draft Victorian Public Transport Energy Consumption and Greenhouse Gas Emissions report
  11. investigates the potential costs and benefits of sourcing electricity from renewable sources.
-



# Appendix A.

## *Audit Act 1994* section 16— submissions and comments

### Introduction

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In accordance with section 16(3) of the *Audit Act 1994*, a copy of this report, or part of this report, was provided to the Department of Transport, Planning and Local Infrastructure, VicRoads and Public Transport Victoria.

The submissions and comments provided are not subject to audit nor the evidentiary standards required to reach an audit conclusion. Responsibility for the accuracy, fairness and balance of those comments rests solely with the agency head.

Responses were received as follows:

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**RESPONSE provided by the Secretary, Department of Transport, Planning and Local Infrastructure.**



**Department of Transport,  
Planning and Local Infrastructure**

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Mr John Doyle  
Auditor-General  
Victorian Auditor-General's Office  
Level 24, 35 Collins Street  
MELBOURNE VIC 3000

Dear Mr Doyle

**PROPOSED PERFORMANCE AUDIT REPORT – MANAGING THE ENVIRONMENTAL IMPACTS OF TRANSPORT**

Thank you for your letter of 30 July 2014 providing me with the opportunity to respond to the audit report *Managing the Environmental Impacts of Transport*.

My response to the recommendations is outlined in the table below.

Recommendation	Response
1 and 4	Support in Principle. DTPLI will strengthen its strategic approach to reducing the environmental impacts of transport. Any policy implications in relation to a statewide strategy will be worked through with Government at the appropriate time.
2	Supported. DTPLI will review its governance arrangements and further develop mechanisms to monitor and coordinate agency actions related to the environmental impacts of transport by the end of 2015.
3	Supported. DTPLI is developing an outcomes framework to measure performance in a range of areas. This includes the environmental impacts of transport. The framework will be finalised in the course of 2014-15.
8	Supported. DTPLI will publish the results of the Fleetwise project and the Electric Vehicle trial when the respective reports are completed by the end of 2014.

Yours sincerely

**Christine Wyatt**  
A/g Deputy Secretary Transport

1518114



## Auditor-General's response to the Department of Transport, Planning and Local Infrastructure

The Department of Transport, Planning and Local Infrastructure (DTPLI) has indicated that it supports in principle Recommendations 1 and 4 to:

- develop a statewide strategy that sets out clear strategic priorities and actions, with statewide objectives, targets, and performance measures to address the environmental impacts of the transport system
- ensure that the priorities and performance measures contained in the proposed statewide strategy are reflected in the department's and relevant portfolio agencies' corporate plans.

However, the *Transport Integration Act 2010* (the Act) makes it clear that DTPLI's role is to:

- ensure that the transport system is provided consistent with the vision statement and the transport system objectives
- determine strategic policies which specify priorities for the transport system that address current and future challenges
- be the lead in all of the strategic policy, advice and legislation functions relating to the transport system.

We have established that the environmental impacts of the transport system are significant and pose a growing threat to our environment and health. It is therefore clearly within the scope of DTPLI's obligations under the Act to address this major challenge for the state's current and future generations, and to proactively advise the government accordingly on potential policy responses.

While it is the government's prerogative to accept or reject this advice, this does not negate DTPLI's obligation to provide frank and fearless advice in the first instance on such matters.

However, for the reasons noted in this report, this audit has found that DTPLI failed to properly address this significant challenge when advising the government during the development of the state's proposed strategic transport and land-use planning framework.

**RESPONSE provided by the Chief Executive, VicRoads**



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Dear Mr Doyle

**PROPOSED PERFORMANCE AUDIT REPORT - MANAGING THE ENVIRONMENTAL IMPACTS OF TRANSPORT**

Thank you for your letter dated 30 July 2014, inviting VicRoads to respond to the abovementioned report.

I would like to acknowledge the extensive interaction with your office, and the opportunities for comment provided during the conduct of the audit. VicRoads accepts the recommendations, and as noted within the report, has already commenced work to address the recommendations made.

I understand that you are primarily seeking advice in relation to the specific actions that VicRoads proposes to undertake in response to these recommendations, along with the anticipated timeframes. Accordingly, VicRoads' advice to this matter is provided in **Appendix A**.

Should you require any further information, Dr Helen Murphy, VicRoads' Director, Environmental Strategy (Tel: 9854 2644), would be pleased to assist.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'John Merritt'.

**JOHN MERRITT  
CHIEF EXECUTIVE**

5 / 08 / 2014

Attach.



VicRoads ABN 61 760 960 480

PSL 7

**RESPONSE provided by the Chief Executive, VicRoads – continued**

**Appendix A**

**Recommendation 5**

*That VicRoads assures that key performance indicators developed under its new five year strategy and corporate plan are outcomes focussed to measure the impact of related actions on the environment.*

**Response**

The Sustainability and Climate Change Strategy is due to be updated in 2014/2015, to enable a new set of directions for the period 2015-2020.

As part of this process and in conjunction with the new corporate plan, outcome focussed performance measures are currently being investigated to ensure that any measure(s) adopted will be transparent and robust, and will adequately reflect the obligations of the agency.

VicRoads anticipates that progress against these measures will be reported through the VicRoads Annual Report.

**Recommendation 9**

*That VicRoads develops arrangements to monitor and report on the environmental impacts of its initiatives to improve traffic flow and the mode share of public transport.*

**Response**

VicRoads is developing a Road Use Strategy to guide how Victoria's arterial road network is operated and managed to best accommodate competing demands. This will include strategic directions and initiatives around improving traffic flow and mode share of public transport, and will identify ways of assessing the effectiveness of these initiatives in contributing towards desired economic, social and environmental outcomes. VicRoads is targeting having a draft strategy prepared by the end of 2015. The development of this strategy will inform the development of appropriate indicators.

**RESPONSE provided by the Chief Executive Officer, Public Transport Victoria**



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VAGO file no: 30028  
Our ref: DOC/14/156142

Mr John Doyle  
Auditor-General  
Victorian Auditor-General's Office  
Level 24, 35 Collins Street  
MELBOURNE VIC 3000



Dear Mr Doyle

**Proposed Performance Audit Report *Managing the Environmental Impacts of Transport***

Thank you for your letter dated 30 July 2014 and the opportunity to provide comment on the proposed audit report on *Managing the Environmental Impacts of Transport*. I would also like to acknowledge the professionalism of the staff from your office who conducted the audit.

PTV notes the audit recommendations in relation to managing the environmental impacts of public transport, and our responses are outlined below.

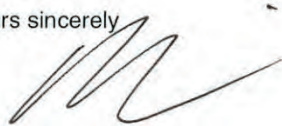
No.	VAGO Recommendation – That PTV:	PTV's Response
6	Develops specific actions, targets and related performance measures to support achievement of defined statewide priorities for improving the environmental performance of the public transport system and publicly reports on its related performance against these measures each year	PTV will: <ul style="list-style-type: none"> <li>a. Incorporate priorities for improving the environmental performance of the public transport system into its Corporate Plan.</li> <li>b. Commit to the completion of a corporate strategy for the environmental and sustainable performance of the public transport system. This will include a 3-year blueprint and roadmap for the application and integration of environmental and sustainable performance for the public transport system. This strategy will guide PTV's investment lifecycle and network operations including any re-franchising arrangements.</li> <li>c. Become a member of the Infrastructure Sustainability Council of Australia (ISAC) and consider applying the Infrastructure Sustainability Rating Tool to PTV's projects.</li> </ul>

**RESPONSE provided by the Chief Executive Officer, Public Transport Victoria – continued**

No.	VAGO Recommendation – That PTV:	PTV's Response
7	Systematically evaluates the environmental outcomes of major investments in public transport including, where relevant, by estimating the vehicle kilometres saved and the associated reduction in greenhouse gas and other emissions relative to defined targets	<p>The systematic evaluation of environmental outcomes are embedded in PTV's project development cycle:</p> <ul style="list-style-type: none"> <li>a. Forecast private vehicle kilometres saved by a project are estimated by PTV economists as part of business case development. PTV economists liaise with the Market Surveys Team (Marketing and Product Development Division) to ensure that actual private vehicle kilometres saved are captured in future post project implementation surveys.</li> <li>b. Outcomes from public transport projects are proposed to be systematically measured as it is the main focus of Stage 8 of PTV's recently introduced Investment Life-cycle for projects</li> </ul>
10	Addresses all recommendations from the former Department of Transport's <i>Victorian Public Transport Energy Consumption and Greenhouse Gas Emissions</i> report	PTV has created a new Safety and Environment Division and is in the process of recruiting an Environment and Sustainability Manager to action the recommendations.
11	Investigates the potential costs and benefits of sourcing electricity from renewable sources	PTV will work with the state government and network operators to investigate the potential costs and benefits of sourcing electricity from renewable sources. The high energy demands of the tram and train network pose some challenges for renewable energy sources.

Should you require any further information, Brodie Woodland, Director of Governance and Legal (Tel: 03 9027 4705), would be pleased to assist.

Yours sincerely



**MARK WILD**  
Chief Executive Officer

11 / 8 / 14





# Auditor-General's reports

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## Reports tabled during 2014–15

<b>Report title</b>	<b>Date tabled</b>
Technical and Further Education Institutes: Results of the 2013 Audits (2013–14:1)	August 2014
Coordinating Public Transport (2013–14:2)	August 2014

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