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**Version Control**

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Document Commencement: 1 June 2015

<table>
<thead>
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<th>Version</th>
<th>Purpose</th>
<th>Content Change</th>
<th>Issue Date</th>
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<tr>
<td>1.0</td>
<td>Initial consultation</td>
<td>Nil – initial draft</td>
<td>17-8-2015</td>
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| 2.0     | Unit Managers Consultation     | • Increased scope to plant and equipment operators also
                                                                   • Encompass Eco-driving at home    | 7-9-2015    |
| 5.0     | Final for Director endorsement | • Nil                                                                         | 10-9-2015   |

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**Endorsed**

Garry Harding
Director City Operations

**Signature**

**Date**

21/9/15
Background and context

What is eco-driving?
Eco-driving is a driving style that helps the environment and combats climate change by reducing fuel consumption and greenhouse gas emissions. Eco-driving applies not just the drivers of City owned cars and trucks, but also to the operation of a wide range of plant and equipment, both large and small.

Driving skills, techniques and behaviours can make a substantial difference to the amount of fuel used for a journey and can extend to a wider range of benefits:

- Eco-driving can contribute significantly to reduced fuel consumption and costs for the individual and their organisation.
- Eco-aware drivers use 10 to 15 per cent less fuel than drivers without eco-driving skills and behaviours.
- Eco-drivers facilitate smoother traffic flows, with less stop-start angst and aggression.
- Eco-driving leads to reduced noise pollution.
- Eco-drivers produce a more comfortable, efficient, and economic ride.
- Eco-drivers reduce wear, tear and the need for repairs, so fewer resources are needed to replace environmentally costly components such as brakes, lubricants and tyres.
- Eco-drivers retain a greater understanding of their responsibilities to other road users and to the environment for a long period after training.
- Eco-driving can reduce crash involvement by up to 40 per cent.

Objectives
The key objectives of this eco-driving strategy are to:

1. Increase awareness of eco-driving and its benefits
2. Embed a culture of low-emission driving behaviour
3. Improve low-emission driving skills and techniques
4. Produce a minimal carbon footprint

Principles
The key principles of eco-driving include:
- Smoothness;
- Efficient use of momentum;
- Anticipation and prediction;
- Planning; and
- Optimising low-emission technologies.
Strategic context
The Strategy and Assets Group delivers a range of physical and business services through its annual Business Plan. That plan links upward through the corporate Operations Plan to deliver the Sustainable Sydney 2030 program. Fleet Services operates as a section of the Strategy and Assets Group with its key strategic driver as the Fleet Management Strategy.

One stream of the Fleet Management Strategy 2014-2016, monitors and assesses the viability of new fuels and vehicle technologies to reduce greenhouse gas emissions. It includes clear plans to transition from using traditional non-renewable energy sources to more sustainable options. Many of these physical solutions for reduced emissions have now been exhausted and will remain static until new products and technologies become available in Australia.

The Fleet Management Strategy therefore recognises that working with the City’s drivers on improved driving behaviours and skills to further reduce emissions is important. This eco-driving strategy responds to that need.

Business activities
The City’s Strategy and Assets Group undertakes the following activities to promote, and ensure workers at the City have access to, eco-friendly transport options:

- Industry leadership in promoting and educating fleet managers across the public and private sectors on the uptake and use of low-emission fleet technologies and services;
- Lobbying manufacturers for access to low-emission vehicles and technologies currently unavailable in Australian markets;
- Trialling and assessing new low-emission products and technologies;
- Managing the annual plant and vehicle replacement program to ensure the consideration of low-emission replacements and optimal life cycling;
- Providing driver education services to staff promoting eco-driving principles, behaviours and skills to result in reduced emissions;
- Maintaining, servicing and repairing the City’s fleet vehicles, heavy plant and equipment to ensure optimal running efficiencies;
- Managing the City’s vehicle key control, fuelling and carpooling systems to capture and model data for informed decision making; and
- Managing the City’s bike fleet as an alternative zero-emission transport mode.
Our values and eco-driving

The City's values and behaviours are central to achieving a Sustainable Sydney by 2030. They are a foundation for our staff to fulfil the City’s purpose to lead, govern and serve and enable our aspirations for a city which is green global and connected. Eco-driving plays an important role in demonstrating environmental leadership while delivering services to our communities.

The City's employees are custodians of public trust and confidence. In recognising this, the City is committed to building a high performing culture built on a set of values which guide us in how we work, interact with each other and make decisions. Our driving in badged City vehicles is on public display at all times and City staff are required to lead with exemplary driving.

The principles of eco-driving are closely aligned with the City's values in the following ways:

<table>
<thead>
<tr>
<th>Values</th>
<th>As eco-drivers:</th>
</tr>
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<tbody>
<tr>
<td>Collaboration</td>
<td>We work together to reduce emissions by agreeing and using practical eco-driving methods and fuel choices.</td>
</tr>
<tr>
<td>Courage</td>
<td>We demonstrate to others that challenging and changing driving styles can benefit the environment.</td>
</tr>
<tr>
<td>Integrity</td>
<td>We take responsibility for our vehicle emissions footprint.</td>
</tr>
<tr>
<td>Innovation</td>
<td>We constantly seek new ways to reduce the environmental effects of using a motor vehicle.</td>
</tr>
<tr>
<td>Quality</td>
<td>We drive as professional eco-drivers at all times.</td>
</tr>
<tr>
<td>Respect</td>
<td>We respect the environment and the vision for Sustainable Sydney 2030.</td>
</tr>
</tbody>
</table>

What's in the air?

Scientific evidence shows that greenhouse gas emissions from human activity, particularly from the use of fossil fuels, are contributing to climate change which is now occurring faster than initially predicted.

An aspect of human activity which emits significant greenhouse gases is the use and dependence on motor vehicles as a key mode of transport. Fleet emissions contribute approximately seven per cent to the City’s total operational emissions footprint.

Climate change occurs as a result of greenhouse gases building up in the atmosphere. These gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and chlorofluorocarbons (CFCs). The gases trap heat radiating from earth toward space, warming the planet’s surface.

In 2009, road transport accounted for 13.2% of Australia’s total greenhouse gas emissions. Specifically, passenger cars accounted for 7.5%, and trucks/buses 5.5% of Australia’s total greenhouse gas emissions.

Greenhouse emissions from road transport have been increasing at an average rate of 1.4% per annum since 1990.
Reduced vehicle usage and eco-driving are positive ways an individual can reduce negative transport impacts on the environment. Further, the City is minimising its dependence on fossil fuels altogether by using green energy wherever possible. For example, the City generates solar electricity to offset the charging of its fleet of zero-emission electric cars.

Emission reduction targets
The City has adopted greenhouse gas emission reduction targets in response to mounting evidence of a warmer, more unstable climate. It is working to reduce carbon emissions by 70 per cent by 2030, based on 2006 levels.

The City reduced its fleet emissions by 26 per cent over the four years prior to June 2014 without reducing service delivery. Its aim now is to limit further growth in emissions until new low-emission fuels and vehicle technologies are available in Australia.

<table>
<thead>
<tr>
<th>Operational Plan Measures</th>
<th>Target 2015/16</th>
</tr>
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<tbody>
<tr>
<td>Maintain fleet CO2 emissions at 2013/14 levels</td>
<td>&lt; 2,350 Tonne CO2</td>
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Fleet emission reduction targets are absolute and are established regardless of a number of factors influencing their growth towards 2030. An increase in the number of dwellings in the City from 90,000 to 138,000 will require an increase in the scope and frequency of delivered services, generating:

- An increase in the distances travelled by the City's fleet vehicles.
- An increase in the number of fleet vehicles required.
- An increase in City staff numbers and drivers.

Eco-driving achievements
A four-year, multi-faceted emission reduction program implemented by the City across its vehicle fleet resulted in a 26 per cent decrease of greenhouse gas emissions between 2010 and 2014. This exceeded the target of 20 per cent and was largely supported by the transition to sustainable biodiesel for operational vehicles and the introduction of electric and hybrid passenger vehicles and trucks.

The continuous review of vehicle use and promotion of resource sharing has reduced the City's fleet from 600 vehicles in 2006 to 440 vehicles in 2015 without any reductions in service delivery. Over 20 zero-emission electric cars, 40 hybrid cars and 66 diesel electric hybrid trucks have been added to the fleet, which has reduced greenhouse gas emissions by up to 30 per cent per vehicle. All electric vehicle charging is offset by 100 per cent clean energy generated by the City's own solar PV installations.

The City has taken a leadership role in promoting sustainable fleet management across NSW local government, State Government and the national fleet sector.
The City has led by example and proven that:

- **Sustainable bio-diesel does work effectively;**
- **Hybrid and electric vehicles are practical, efficient and reduce emissions;**
- **Bicycles are the best transport mode for short trips; and**
- **Driver education is critical.**

The City’s achievements in sustainable fleet management and eco-driving to reduce fleet emissions have been recognised by receiving a number of industry and public sector awards:

**The Australasian Fleet Management Association - Environment Award 2012**

"The award is the best form of recognition of our efforts, and being presented by our industry peers and peak body makes it all the more meaningful. We are really keen to keep the City of Sydney at the green edge of fleet management and an award like this gives us the motivation to push even harder into the difficult and less trodden improvement areas."

- Chris Binns, Manager Strategy and Assets for City of Sydney, The City of Sydney, Winner of the Fleet Environment Award in 2012

**NSW Government Green Globe Award – Local Government Sustainability 2014**

The NSW Government’s Green Globe Awards celebrate excellence, leadership and innovation in environmental sustainability. A four-year, multi-faceted program implemented by the City of Sydney across its vehicle fleet resulted in a 26 per cent decrease of greenhouse gas emissions to 2014.

**Local Government NSW / Office of Environment and Heritage – Excellence in the Environment Award 2014**

The Local Government NSW and OEH Excellence in the Environment Awards were initiated in 1998 and is held annually. The Awards are open to all councils in NSW. They recognise outstanding achievements by Local Government in managing climate change and protecting the environment.

The City was the winner of the Climate Change Action category for its Sustainable Fleet Management Program.
Eco-driving vehicle technologies

Motor vehicle selection is an important aspect of minimising carbon effects and maximising emission reductions. The City has considered and will continue to monitor the feasibility of the eco-driving technologies discussed below:

**Electric vehicles (EVs)**

Electric vehicles provide the same mobility as internal combustion engine (ICE) cars in most town and urban driving conditions. Paired with 100 per cent renewable energy, they enable a truly zero-emission mode of transport. Regardless of the energy source or emission footprint, it is imperative for drivers to implement eco-driving techniques.

Eco-driving enhances the range of an EV, reduces charging time and reduces the energy required to recharge batteries. Appropriate acceleration and braking techniques can reduce the power used and regenerate the batteries through braking.

**Hybrid vehicles (HEVs)**

Hybrid vehicles use conventional small petrol or diesel fuelled engines to charge batteries that power electric traction motors to drive the vehicle.

The concept enables a smaller petrol or diesel engine, offering lower fuel consumption but, when you need the additional power or torque for acceleration or hill climbing, the electric motor kicks in.

By using hybrid technology, manufacturers aim to get the best of both worlds, where you can have a larger vehicle and get lower fuel consumption without sacrificing anything in terms of performance [NRMA].

**Plug-in hybrid vehicles (PHEVs)**

Globally, a number of PHEVs are now available. Local markets are limited to the Holden Volt and the Mitsubishi Outlander, however more PHEVs are due to enter the Australian market in 2016.

PHEVs enable a greater travel range of up to 600 km by pairing a conventional ICE engine with electric motors and battery packs.

An eco-driver can plug in and recharge with renewable energy to operate the vehicle wholly as an EV. Where charging facilities are not available or on long trips, drivers can take advantage of normal ICE operability and range.
Hydrogen fuel cell vehicles (HFCEVs)

Hydrogen fuel cells convert the chemical energy from the fuel, hydrogen, into electricity through a chemical reaction with oxygen.

Fuel cells can produce electricity continuously for as long as these inputs are supplied. The vehicles emit only water vapour and heat and no exhaust fumes or greenhouse gas emissions.

Hyundai has recently introduced demonstration vehicles powered by fuel cells to Australia, but right hand drive production is unlikely before 2018. Various manufacturers in Japan and Europe are now producing left hand drive vehicles and fuelling infrastructure for public use.

Eco-driving fuel technologies

Fleet Services are constantly assessing the value of new fuels and how they can contribute to greenhouse gas reduction in the City.

Diesel

European emission standards define the acceptable limits for exhaust emissions of new vehicles. The emission standards are defined in a series of European Union directives staging the progressive introduction of increasingly stringent standards.

Due to the lower greenhouse gas emissions per kilometre, the City uses diesel powered vehicles wherever better technology is unavailable. The City’s most recently purchased large vehicles are Euro 5 standard compliant, currently the best in Australia.
**Biodiesel**

Biofuels are fuels made from renewable biological feedstock, either crops or waste. The most common biofuels currently available are biodiesel and ethanol. Biodiesel is mineral diesel fuel blended with bio-oils produced from tallow, waste cooking oil or other vegetable oils.

City suppliers of biodiesel are required to supply a product which does not contribute to or impact land clearing, habitat destruction, food crop production, food pricing in developing countries or excessive travel miles.

The City uses biodiesel in all diesel cars, trucks and plant to achieve an average emission reduction of 18 per cent below standard mineral diesel. A 50/50 blend (B50) is used during Autumn, Summer and Spring, while a B20 blend is used during the cooler winter months.

**Petrol**

Petrol engines are the least common powertrain in the City’s vehicle fleet due to their higher emission footprint. Modern petrol engines are however becoming more efficient through improved fuel management and turbo systems.

Petroleum as a fuel has also undergone many technical advances. The most notable being the removal of lead.

**E10 petrol**

Ethanol is an alcohol produced by fermenting sugar, grain (e.g. wheat and sorghum) or other cellulose plant matter using yeasts. In Australia cellulose ethanol is produced to limit the concerns and impacts on food based agriculture. According to Cornell University professor of agriculture David Pimentel powering a car for a single year using ethanol would require 11 acres of corn, space that can be used to feed at least seven people [source: healthandenergy.com]. However, research continues into better ways to produce ethanol. Cellulosic ethanol is made from nonfood products such as corn stalks, the fibrous or woody parts of plants and the starches in grain, wood chips and some grasses.

As a fuel additive of 10 per cent by volume, the benefits of ethanol include burning more cleanly and at higher octane levels, because ethanol contains a lot of oxygen in its chemical structure. Ethanol also produces 30% less carbon particle emissions than regular petrol therefore engines stay cleaner and operate more efficiently. Further, E10 petrol reduces greenhouse gas emissions like carbon monoxide and nitrogen oxides [source: https://ethanol.org].

Most modern cars can be powered on E10 petrol and City staff are encouraged to use it in all petrol powered vehicles.

**Other biofuels**

Emerging technologies will allow a conventional oil refinery to produce renewable biofuels that are indistinguishable from petroleum fuels.

Algal biodiesel is made from algae grown in open ponds or enclosed photo-bioreactors that use light to produce the fuel. Algae can be grown in fresh, salty and waste water. In large photo-bioreactors, algae can potentially capture the carbon dioxide emitted by a coal fired power station and turn it into high quality bio-diesel or jet fuel. The technologies to produce algal bio-diesel are now being developed and scaled up to commercial size plants.

Butanol is another alcohol fuel that can be made from plant matter, but it is not yet widely available.
Eco-driving Technical Innovations

Automated manual transmissions
These are vehicles that have manual gearboxes, but their clutches and gears are operated robotically. Their centre console is marked with the traditional 'P', 'R', 'N' and 'D' labels but the automated manual operates very differently to the heavier, planetary geared automatic transmission. Traditional features of automatic transmissions have been engineered into automated manuals, such as the 'creep' function.

Due to the way automated manual transmissions operate, a different driving method is required to ensure smooth progress. Controlled throttle inputs help to not only facilitate a more gradual take-off and smooth gear changes but will also enhance mechanical life. Several problems can be attributed to drivers who might be unaware that automated manual gearboxes are under greater mechanical stress, with abrupt and erratic throttle movements affecting reliability.

Well driven automated manual transmissions are both safe and reduce emissions.

Idle-off systems
STOP/START idle off systems reduce the time an engine is operating at idle, which is its most inefficient state. Automated engine shutdown when stopped, at idle and with the brake pedal depressed is typical, restarting with the accelerator depressed.

Such systems are now widely available across a range of vehicle platforms. It has been achieved through improved battery performance and engine starting systems.

Idle-off systems must however be used effectively, with attention to safety as well as economy.

Multiple drive modes
Many vehicle manufacturers now offer a range of drive modes which pre-determine engine performance and gear change sensitivity.

Although defaulting to a standard drive mode each time the car is started, a 'Sport' mode can be selected which maintains engine rev's at a higher level, alters fuel management systems for higher performance and more readily changes down gear when accelerating. Conversely, an 'Eco' mode can be selected which reduces engine rev's, alters fuel management systems for optimal fuel saving and reduces the sensitivity of downshift gear selection when accelerating.

Eco-drivers should always select 'Eco' mode to ensure minimal fuel consumption and emissions.
Eco-driving communication and education

The City will continue to aim for a zero increase in emissions from its vehicle fleet, based on its 2014 levels, regardless of distances travelled or changes in fleet composition.

Managing vehicle type and fuel type are the key factors in fleet emission reduction, however, once these areas have been optimised, driver skills and behaviours play an increasingly important role.

Communication

Effective communication is the most important aspect of this strategy to ensure that all stakeholders are aware of and understand the benefits of eco-driving. Particularly, the communications should focus on why reducing fuel usage and emissions are desirable and how they can be reduced.

Communication planning to improve the awareness, skills and behaviours of City vehicle drivers is necessary, and regular review of the success of effective communication will enable the mapping of progress toward improved eco-driving. Key communication mechanisms will include:

1. Conversations about eco-driving when recruiting new driving staff;
2. In-cabin assessment and discussion about eco-driving for all new drivers;
3. Regular eco-driving tips and tricks in Round the Square;
4. Team briefings on eco-driving from the City’s Driver Educator;
5. Conversations about eco-driving during performance reviews;
6. Posters and informative literature provided in the workplace;
7. Links to the ‘Eco-driving Strategy’ on the Citynet;
8. Consultation on the draft strategy with key fleet customers;
9. A formal launch of the strategy and distribution to key people managers;
10. Targeted class room training programs delivered through YourLearning; and
11. On-line training and compliance updates every two years.

Low-risk and Eco-driving Handbook

The Low Risk and Eco-driving Handbook has been developed to provide practical driving advice designed to make your driving experience as low-risk, enjoyable and as environmentally friendly as possible. It is a user guide for drivers.

The handbook includes information for all City employees and must be read and understood before driving City vehicles.

It includes information on how to manage risks associated with driving, as well as tips about car care, eco-driving, vehicle safety and guidelines on what to do in the event of a crash.

The City’s Fleet Services unit can also provide assistance for any staff member on the operation of any vehicle, from bicycles to heavy trucks. If you require further clarification, please contact the Fleet Services Driver Development Team.
Crash Management Strategy 2015

Safe, low-risk driving is a major contributor to eco-driving. Slower, smoother and anticipatory driving styles reduce crashes, as well as save fuel and emissions. The Crash Management Strategy 2015 sets the framework by which the City can reduce the number of crashes involving fleet vehicles. Its objectives are to:

- Promote and embed a zero-crash culture;
- Support and improve driver skills, behaviours and awareness;
- Develop staff pride in driving professionally;
- Enhance leadership capability in Supervisors and Team Leaders;
- Identify the root causes and contributing factors that result in vehicle crashes; and
- Guide business units with strategies and processes to minimise vehicle crashes.

Drivers of City vehicles must display appropriate behaviours at all times. They are required to abide by the City’s Code of Conduct and all policies and strategies relating to fleet vehicles. Compliance will protect Council’s image as well as improve driving safety and environmental performance.

Staff travel plans

City staff are encouraged to walk, cycle or use public transport when travelling for work and are discouraged from using high-emission taxis wherever possible.

The City’s Green Champions have implemented a Transport Hierarchy and Staff Travel Guide to help staff plan and select eco-travel options:

1. **Active Transport** (walking or cycling using the City’s bike fleet)
2. **Public Transport** (buses and trains)
3. **Drive Green** (the City’s fleet of low and zero emissions vehicles)

The City is developing a suite of incentives and services to help staff plan their travel more effectively and now provides end of trip facilities to enable staff to use active transport wherever possible.

Bicycle fleet policy and procedure

To support the transport hierarchy, Fleet Services have established a bicycle fleet for staff use in preference to walking or using fleet cars where longer distances are involved. A range of bikes are available to suit various operational requirements, including electric assist and additional carrying capacity cargo bikes.

Staff who need to use the bike fleet are provided with detailed training on urban riding skills and appropriate personal protective equipment. All City bike use is guided by the Bicycle Fleet Policy and Procedure.

Since establishment of the bike fleet in 2013, City staff have travelled over 8,000 km on emission-free bicycles.
Motor vehicle policy and procedure
The City’s Motor Vehicle Policy and Procedure ensures that the City’s motor vehicles are selected, used and managed consistently and effectively in respect to environmental targets, operational performance, accountability, versatility, costs and safety.

Fleet Services constantly review the requirements of each business unit to determine the optimum vehicle size for their work. Consideration will also be made for multi-tasking vehicles, particularly where some inefficient vehicles are used infrequently.

The policy and procedure are reviewed every two years. An online training and compliance module is under development.

Driver development and awareness
Driver training initiatives include eco-driving awareness programs conducted at toolbox talks and unit meetings together with dedicated training through Your Learning.

Fleet Services will provide up-skilling sessions to team leaders and supervisors from the operational fleet (Cleansing and Waste, Parks, CITO, City Rangers etc.) so information can be provided to all drivers. This will include ‘in-vehicle’ training.

In addition, everyone driving Council owned vehicles will be required to complete an on-line or face-to-face course every two years containing elements from the Low-risk and Eco-driving Handbook.
Eco-driving principles and techniques

Fuel consumption and the environmental benefits of low-risk driving techniques go hand in hand. The key to both is ‘acceleration sense’. The techniques described below will help any driver reduce the carbon footprint of whatever vehicle they are driving, whether at work or at home. They have also been included in the City’s ‘Low-risk and Eco-driving Handbook’.

The right vehicle

The City has reduced the size of its vehicles considerably over the last decade and achieved substantial emission reductions. Where a tipper-ute will suffice, there is no need for a four tonne tipper-truck. Where a small four cylinder diesel van will suffice, there is no need for a large six cylinder utility. Fleet Services will continue to observe utilisation and replace with the right size vehicle.

![Vehicle Images]

Route planning

Route planning is an essential part of eco-driving. Any unnecessary distance travelled uses fuel, including electric vehicles that have shorter ranges and longer refuelling/recharging cycles. Taking the shortest or least congested route by planning the trip in advance can save fuel, time and reduce emissions greatly.

The City’s Fleet operates from a number of depots and offices across the LGA.

Effective planning ensures that vehicles are located as near as possible to where they are required for work.

Staff should not return to base unnecessarily. Doing so is inefficient and can double the amount of fuel used and emissions.
Efficient use of speed

Few of the City's vehicles are driven for long distances at high speeds, but if motorways or distributor roads are used even for short periods, it will increase fuel use or reduce electric charge range. There is little need for City vehicles to be driven quickly for the typical short distances involved in the Sydney LGA.

Take 5 km/h off your usual speed – it’s unlikely to increase your travel time (that’s what traffic lights and crashes do!), but it improves fuel economy and reduces driving stress.

- Note: the City has supported lower speeds in inner City areas and consistent speed zoning. Speed limits set by the RMS are varied throughout the City. Drivers are advised to keep to a maximum speed of 40 km/h across the City where safe.

Less weight on the accelerator

A heavy right foot is the biggest fuel waster. Light use of the accelerator (pretend that there’s an egg under it) is the best way to get the most from any vehicle. Driving smoothly and sticking to the speed limit cuts fuel consumption considerably – and you won’t need to worry about speed cameras.

Acceleration sense is about how you vary your foot pressure on the accelerator pedal so you don’t have to brake very often.

Smoothness

A vehicle driven smoothly uses less energy overall. It enables a more comfortable ride for passengers, protects cargo & equipment and reduces wear. Accelerate gently, but keep with traffic (if the driver behind is not keeping up with you there is no need to pick up speed rapidly).

Time management

If a driver feels the need to rush, they will accelerate rapidly and drive at speeds greater than necessary. They perhaps need to plan their work and travel more effectively and assess their time management skills.

Planning and anticipation

Eco-driving can be achieved by thinking ahead, sometimes further than you can see. The points below are covered in the City’s eco-driver training programs.

- Plan when and where you are going and do not waste fuel looking for a place to park or being held up in traffic. Public transport or sharing a ride may be a better option.
- Keep a three second gap behind other vehicles. Add an extra second for large vehicles and during inclement weather.
• Decelerate early for traffic lights and intersections where you need to stop or give way as your vehicle’s momentum may get you there. In addition, hazards may disappear if you slow down early and give other road users time to complete their manoeuvres.

• Take the route of least resistance, using clear lanes when available.

• Slow down early for turns and don’t accelerate harshly as you straighten the steering – in most cases it’s safer to wait until the wheels are straight before accelerating.

• Anticipate traffic moves, use the correct lane and reduce the number of unnecessary stops (idling) in traffic.

Load management
Excess weight and wind resistance consume fuel. To achieve optimum fuel economy, take out everything that is unnecessary for your journey. Do not carry excessive materials or unnecessary equipment ‘just in case’. Plus, remove roof racks or storage boxes when not carrying a roof load to cut wind resistance. Sensible load management improves fuel efficiency and safety.

Job planning
Many City vehicles attend work sites across the LGA and need to take materials and equipment to site each day. Ensure the tasks for the day are planned and all necessary materials and equipment are anticipated and loaded. Returning to a depot to collect forgotten items wastes fuel and generates extra emissions.

Tyre pressure
Under-inflated tyres apply a greater area to the road surface and increase rolling friction, requiring more energy, fuel and emissions to move the vehicle. Check tyre pressures regularly to minimise rolling resistance. Correct tyre pressure also reduces wear and increases safety. Recommended tyre pressure placards are generally located on the door frame of most vehicles.

Air conditioning
There is a common belief that air conditioning in motor vehicles wastes fuel and energy. This is not always correct. In most vehicles travelling above 60kmh, wind resistance from open windows is actually less fuel efficient than operating the air conditioning.

Refuelling
When refuelling a vehicle, do not over fill it. Do not attempt to top it up after the nozzle has clicked off. This allows space in the tank for fuel and vapours to expand and contract, reducing emissions.
Gear changes
Many of the City’s vehicles run automatic and automatic/manual transmissions. Never let an engine over-rev in a gear which is too low for the travel speed. Unnecessary engine revs consume additional fuel.

Engine off
Decades ago, stopping and restarting diesel engines consumed more fuel than operating it for a few minutes at idle. Modern vehicle technologies and fuel management systems have improved. Drivers are advised to switch their engine off when at idle for more than a couple of minutes. No additional fuel is consumed in restarting the engine.

Warming up
Vehicle engines perform best when operating at normal driving temperatures, however modern engines do not need to be warmed up before driving. The difference in fuel consumption based on engine temperature is negligible and fuel used while warming up is wasted.

Regular maintenance
All City vehicles are regularly serviced and maintained in the line with their manufacturers’ recommendations. This ensures the engine is running at its best and optimises fuel consumption. If your vehicle is running ‘rough’ or not performing as usual, please contact Fleet Services for investigation and remedy. Well maintained engines use less fuel.

Vehicle renewal
The City replaces its vehicles based on set life cycles driven by a range of factors including age, condition, resale values, performance and the availability of better performing new products. In replacing vehicles regularly the City’s eco-drivers are able to take advantage of the latest advances in low-emission vehicle technology. Older vehicles with poor fuel consumption and emissions are disposed, or in some cases retrofitted with new technologies.
Eco-driver Action Plan 2015-2017

This action plan sets out the tasks that will facilitate change to bring about a low-emission ‘eco-driving culture’ amongst all drivers of Council vehicles. It is intended to improve staff awareness about reducing fuel consumption and greenhouse gas emissions.

The action plan commits Fleet Services and its operational driving customers to a range of physical and administrative outcomes, deliverable through the next year and beyond. Its progress, evidenced by reduced greenhouse gas emissions, will be monitored and reported during six monthly performance reviews by respective unit managers.

<table>
<thead>
<tr>
<th>ID</th>
<th>Action</th>
<th>Priority</th>
<th>Timing</th>
<th>Action by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Eco-driving Communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Launch the Eco-driving Strategy to key customers</td>
<td>High</td>
<td>Aug 2015</td>
<td>Mgr S&amp;A</td>
</tr>
<tr>
<td>1.2</td>
<td>Attend unit team meetings quarterly in C&amp;W, Community Living Rangers, Parks &amp; Trees and City Infrastructure units to respond to eco-driving management issues and questions</td>
<td>High</td>
<td>Monthly</td>
<td>DDO/Fleet Mgr</td>
</tr>
<tr>
<td>1.3</td>
<td>Publish regular eco-driving tips in Round the Square</td>
<td>High</td>
<td>Monthly</td>
<td>DDO</td>
</tr>
<tr>
<td>1.4</td>
<td>Develop and present flyers and depot posters as training content on key eco-driving principles</td>
<td>Medium</td>
<td>Ongoing</td>
<td>DDO</td>
</tr>
<tr>
<td>1.5</td>
<td>Develop and present video based training content on key eco-driving principles</td>
<td>Medium</td>
<td>Ongoing</td>
<td>DDO</td>
</tr>
<tr>
<td>2.0</td>
<td>Fuel and Emissions Data and Reporting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Provide quarterly emission and fuel data to unit managers</td>
<td>High</td>
<td>Quarterly</td>
<td>M3 Managers</td>
</tr>
<tr>
<td>2.2</td>
<td>Analysis of emissions data to identify spikes and trends</td>
<td>Medium</td>
<td>Quarterly</td>
<td>M4 Managers</td>
</tr>
<tr>
<td>2.3</td>
<td>Place unit emissions data on staff noticeboards</td>
<td>High</td>
<td>Quarterly</td>
<td>Team Leaders</td>
</tr>
<tr>
<td>2.4</td>
<td>Download, analyse and compare on-board engine management data from selected vehicles to assess unacceptable peak speeds, average speeds, engine rev's and braking patterns</td>
<td>Medium</td>
<td>Jul 2016</td>
<td>DDO/Fleet Supervisors</td>
</tr>
<tr>
<td>2.5</td>
<td>Unit managers to report on emissions and improvement plans at six monthly performance reviews with Director</td>
<td>High</td>
<td>24 hours</td>
<td>M4 Managers</td>
</tr>
<tr>
<td>3.0</td>
<td>Eco-driving skills, knowledge and compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Regular eco-driving briefings at team meetings and toolbox talks – various topics</td>
<td>Medium</td>
<td>Ongoing</td>
<td>DDO</td>
</tr>
<tr>
<td>3.2</td>
<td>In-cab training of new drivers by experienced operations staff</td>
<td>Medium</td>
<td>At start</td>
<td>DDO</td>
</tr>
<tr>
<td>3.3</td>
<td>Brief drivers on the fuel efficient operation of new vehicle types</td>
<td>High</td>
<td>At start</td>
<td>DDO</td>
</tr>
<tr>
<td>3.4</td>
<td>Annual ‘Low Risk and Eco-Driver Driving Handbook’ training</td>
<td>Medium</td>
<td>Dec 2015</td>
<td>M4 Managers</td>
</tr>
<tr>
<td>3.5</td>
<td>Annual ‘Motor Vehicle Policy &amp; Procedure’ training</td>
<td>Medium</td>
<td>Dec 2015</td>
<td>M4 Managers</td>
</tr>
<tr>
<td>3.6</td>
<td>Ensure induction of new drivers</td>
<td>High</td>
<td>At start</td>
<td>M4 Managers /DDO</td>
</tr>
<tr>
<td>3.7</td>
<td>Ensure drivers of all trucks have a minimum LR class licence</td>
<td>High</td>
<td>Ongoing</td>
<td>M4 Managers</td>
</tr>
<tr>
<td>3.8</td>
<td>Establish, administer and report on a driver performance rating system to recognise good driving</td>
<td>High</td>
<td>Jul 2016</td>
<td>DDO</td>
</tr>
<tr>
<td>3.9</td>
<td>Extend the eco-driving culture to ‘driving at home’ to minimise the impact of non-work related emissions</td>
<td>Medium</td>
<td>Jul 2016</td>
<td>DDO</td>
</tr>
<tr>
<td>4.0</td>
<td>Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Level</td>
<td>Date</td>
<td>Responsible Party</td>
</tr>
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</tr>
<tr>
<td>4.1</td>
<td>Review the Low Risk and Eco Driving Handbook every 2 years</td>
<td>Low</td>
<td>Jul 2017</td>
<td>DDO</td>
</tr>
<tr>
<td>4.2</td>
<td>Review the Motor Vehicle Policy and Procedure every 2 years</td>
<td>Low</td>
<td>Jun 2015</td>
<td>Mgr Strategy and Assets</td>
</tr>
<tr>
<td>4.3</td>
<td>Keep up to date on relevant eco-driving and driver education information, training and materials</td>
<td>Medium</td>
<td>Ongoing</td>
<td>DDO/Fleet Mgr/Mgr S&amp;A</td>
</tr>
<tr>
<td>4.4</td>
<td>Develop concepts and install GPS within selected vehicles to enable traffic alerts and route planning</td>
<td>Medium</td>
<td>Jul 2016</td>
<td>Fleet Mgr</td>
</tr>
<tr>
<td>4.5</td>
<td>Ensure realistic &amp; achievable work schedules, rosters and timetabling to avoid drivers rushing to complete tasks</td>
<td>Medium</td>
<td>Ongoing</td>
<td>M4 Managers</td>
</tr>
<tr>
<td>4.6</td>
<td>Trial the ‘Go-far’ dashboard mounted emissions monitoring tool for 10 drivers over a 2 month period</td>
<td>Medium</td>
<td>Oct 2015</td>
<td>DDO</td>
</tr>
</tbody>
</table>