

Essential Services Noise Management

PLAN • 2025



**CITY OF
PERTH**
City of Light



**Waste Collection
& Street Cleaning**





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GREEN MACHINES

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WARNING
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1. Introduction

The City of Perth (the City) engaged Lloyd George Acoustics to prepare an Essential Services Noise Management Plan (ESNMP) for the City's waste collection and street cleaning operations, to address noise impacts to noise-sensitive receivers from 'out-of- hours' essential services carried out by the City within its boundaries – see Appendix A for the City of Perth Street Cleaning and Sanitation 'Out-of-Hours Works' Maps. Current maps are available on the City's website. Such essential services include:

- Residential, Commercial, Event and Public Place Waste collections,
- Road, public place and footpath cleaning.

This ESNMP has been prepared to comply with regulation 14A of the *Environmental Protection (Noise) Regulations 1997* (the Regulations) with guidance taken from the Department of Environment Regulation Draft Guideline DER2014/001628.

The Regulations set noise limits to manage noise levels across different areas, including public spaces. While the City strives to minimise disruption, essential services like waste collection and street cleaning may occasionally exceed these limits, especially in residential areas. The City is committed to balancing community needs by ensuring these services are carried out as efficiently and considerately as possible.

This ESNMP replaces and supersedes the City's Essential Services Noise Management Plan 2020 and the City's Wolf Lane Noise Management Plan.

The Regulations prescribe that a noise management plan expires after a maximum of 3 years from the day on which it is approved by the CEO following public consultation.

The ESNMP will be reviewed annually to ensure better practice noise management techniques are continuing to be used.

Appendix B contains a description of the terminology used throughout this report.





2. Legislation

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997*. Clause 3, 7, 8 and 14A are relevant to this ESNMP.

Clause 14A provides requirements for ‘essential services’, e.g. the collection of waste, or the cleaning of roads, public places and footpaths, as these activities often exceed assigned levels.

Clause 14A categorises these activities into two classes:

Class 1 works: Conducted between 7am and 7pm from Monday to Saturday, or between 9am and 7pm on Sundays and public holidays.

Class 2 works: Any activities occurring outside these hours.

Clause 7 of the regulations sets noise limits for premises and public spaces. However, Class 1 works are exempt as long as they are carried out in the quietest reasonable way using appropriate equipment.

Class 2 works may also be exempt from Clause 7, but only if they follow an approved Noise Management Plan ensures noise is managed responsibly, as outlined in Clause 14A(3) as follows:

(3) *Clause 7 does not apply to noise emitted in the course of carrying out class 2 works if the works are carried out in accordance with a noise management plan, excluding any ancillary measure, for class 2 works approved in writing by the CEO.*

The requirements for a noise management plan for class 2 works are defined in Clause 14A(6) as follows:

(6) *A noise management plan for class 2 works is to include, but is not limited to –*

- (a) *details of vehicle or equipment evaluation and purchase policies adopted to select, on a reasonable and practicable basis, the quietest vehicle or equipment available; and*

- (b) *measures to be adopted to minimise noise emissions resulting from carrying out the works; and*
- (c) *justification for carrying out the works during the times of day to which the class relates; and*
- (d) *a description of the specified works to be carried out during the times of day to which the class relates; and*
- (e) *operator training programs; and*
- (f) *community information on the manner in which the specified works will be carried out; and*
- (g) *a complaints response procedure.*

It should be noted that some types of noise emissions are exempt from compliance, and these are listed in Clause 3. Of particular significance to this ESNMP, it is noted that the noise emissions from the propulsion and braking systems of motor vehicles operating on a road are exempt – refer Clause 3(1)(a).

Under standard conditions Clause 8 details the measurement of noise at the point of reception when, to the extent practicable, other noises that would contribute to the measured noise level are not present (assigned level).

The other noises that would contribute to the measured noise level are influencing factors. The ‘influencing factor’ differs between premises and takes into account the existing level of noise at each premise. For example, premises surrounded by industrial and commercial land and/or major roads would experience higher noise levels (background noise) than more suburban areas, therefore they would have a higher influencing factor.

The assigned level of noise for all premises is detailed in Table 2.1, directly referencing Clause 8 of the *Environmental Protection (Noise) Regulations 1997* (the Regulations) describing assigned levels.



Table 2.1 Assigned Noise Levels

TYPE OF PREMISES RECEIVING NOISE	TIME OF DAY	ASSIGNED LEVEL (dB)		
		L _{A 10}	L _{A 1}	L _{A max}
Noise sensitive premises: highly sensitive area	7am – 7pm Monday to Saturday	45 + influencing factor*	55 + influencing factor	65 + influencing factor
	9am – 7pm Sunday and public holidays	40 + influencing factor	50 + influencing factor	65 + influencing factor
	7pm – 10pm All days	40 + influencing factor	50 + influencing factor	55 + influencing factor
	10pm on any day to 7am Monday to Saturday and 9am Sunday and public holidays	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80

*Calculation of the influencing factor is defined in Schedule 3 of the Environmental Protection (Noise) Regulations 1997

3. Equipment Details

3.1 Waste Collection

The equipment used for out-of-hours waste collection consists of 8, 12, 20 and 22 cubic metre rear and side loading waste vehicles. Noise levels generated by trucks during typical kerbside collection were recorded at the City of Perth's Depot in Osborne Park on 19 December 2024. Typical equipment types and noise levels are presented in Table 3.1.

It is noted the L_{Aeq} noise emissions from the waste trucks are dominated by the hydraulic power unit for the lifting mechanism since the truck remains at low idle during the loading and compaction cycle. Maximum noise levels will depend on the type of waste in the bins and also, to some degree, how the

bins are handled during the loading and unloading cycle. The measurements in Table 3.1 show that the L_{Aeq} noise levels are similar regardless of the size of the truck.

Background noise levels during the noise measurements were in the range of L_{Aeq} 50 to 53 dB and didn't influence the plant noise measurement results.

3.2 Street Cleaning Plant and Equipment

The cleaning fleet includes a variety of plant, from large road sweepers to small footpath high pressure cleaners, sweepers and hand-held leaf blowers.

Typical equipment types and noise levels are presented in Table 3.2.

Table 3.1 Typical Waste Collection Plant Noise Levels

PLANT DESCRIPTION	OPERATIONAL MODE	REGISTRATION NUMBER	UNIQUE ID#	$L_{Aeq,1min}$ NOISE LEVELS	DISTANCE FROM SOURCE TO MEASUREMENT
				AVERAGE OF ALL SIDES	
Isuzu 260 r - Rear Loader	Hi Revs	1IES 416	RT1665	67	7
	Tipping an Empty Bin			68	3
	Tipping a Full Bin			87	3
	Reverse Croaker			76	7
Isuzu 300-- Rear Loader	Hi Revs	1IFQ 654	RT2114	66	7
	Tipping an Empty Bin - No Blade			74	3
	Tipping an Empty Bin - With Blade			72	3
	Reverse Croaker			75	7
Volvo FE - Side Loader	Hi Revs	1GV1 141	RT2110	69	3
	Tipping an Empty Bin			71	3
	Reverse Croaker			74	7

Table 3.2 Typical Cleaning Plant Noise Levels

PLANT DESCRIPTION	OPERATIONAL MODE	REGISTRATION NUMBER	UNIQUE ID#	L _{AEQ,1MIN} NOISE LEVELS	DISTANCE FROM SOURCE TO MEASUREMENT
				AVERAGE OF ALL SIDES	
Toyota Hiace L/V	Generator Running	1HIP 458	PV2582	84	3
	Spraying High Pressure Water			82	3
STIHL BG 86C Petrol Leaf Blower	Idle	N/A	MA2016	64	3
	Full Throttle			73	3
Milwaukee M18 F2BL Electric Leaf Blower	Full Power	N/A	MA7111	83	3
Hino Euro 5 1426 Road Sweeper	Hi Revs	1GRD 726	RS3620	72	7
	Operational @ Hi Fan Speed - Walking Along beside Whist Moving			90	3
Hi-Lux L/V	On-board Honda iGX 390 Generator Running on tray	1HGR 041	TU1820	72	3
	Hi Pressure Water Spraying @ 300psi			87	3
Green Machines Electric Mini Sweeper	Hi Revs	1IEJ651	RS1624	76	7
	Reverse Croaker			68	7
	Walking Alongside Whilst Sweeping			90	3
CMAR N 286 R Mini Sweeper	Hi Revs	1HBE005	RS3650	77	7
	Reverse Croaker			71	7
	Walking Alongside Whilst Sweeping			80	3
Isuzu 300 Water Truck	Hi Revs	915 PCC	LT349	69	7
	Reverse Croaker			76	7
Mitsubishi FSO Flatbed	Hi Rev Tipping Tray	N/A	MA2016	70	7
	Reverse Croaker			77	7

4. Justification For 'Out-of-Hours' Work

Perth City is the capital of Western Australia, formally recognised in the *City of Perth Act 2016*. Therefore, the City of Perth has a responsibility not only to its ratepayers but plays an important role in representing the broader Perth area and the State of Western Australia on both a national and international level. As a capital city, Perth fosters a thriving and environmentally sustainable 24-hour economy to attract tourists, support businesses, and create a vibrant sense of place. This requires well-maintained streets, high-quality public amenities, and a commitment to balancing civic, economic, social, cultural, and environmental priorities.

As part of this responsibility, the City of Perth ensures the city remains clean, safe, and welcoming for residents, workers, and visitors. Maintaining a 'business-ready' environment requires regular waste collection and street cleaning, particularly in high-traffic areas such as entertainment precincts on Saturday and Sunday mornings. These essential services help uphold Perth's reputation as a dynamic hub for commerce, tourism, and cultural activity.

At the same time, the City is committed to sustainable growth, balancing economic prosperity with environmental and community well-being. By investing in high-quality public spaces, supporting local initiatives, and maintaining essential services, the City strengthens Perth's standing as a progressive, globally connected destination. Please note that this ESNMP does not cover event-related noise unless it is linked to waste collection or cleaning services provided by the City.

Areas of the CBD (Central Business District), West Perth, East Perth, Northbridge, Claisebrook and Nedlands/Crawley have a number of businesses commencing trading before 7am, which results

in increased pedestrian and vehicular traffic, and reduced parking in the area. Such businesses include cafes and restaurants with outdoor dining areas. The increase in pedestrian and vehicle traffic makes waste collection, road and pavement cleaning during the day impracticable and dangerous, potentially hampering the flow of traffic causing significant delays, inconvenience and frustration for other road users. Also, parked vehicles including private contractors and delivery vans and trucks are often found to block access to bins, sections of roads and pavement, and this problem becomes more significant after 7am as more vehicles descend on the CBD and dining areas.

As such, conducting the works 'out-of- hours' allows for:

- Significantly reduced pedestrian and vehicle interactions, therefore promoting safety to the public and the City's workforce,
- Improved access to waste collections points resulting in:
 - shorter waste collection cycles and therefore noise exposure,
 - improve manual handling for City of Perth personnel, therefore minimising risk of injury,
- Improved access on main roads i.e. no obstructing traffic, avoidance of road/ construction works,
- The areas where waste collection and cleaning services are being carried out experience a significant increase in vehicular traffic volumes from 7am onwards. This is shown in Table 4.1, which summarises the traffic increase from 6am to 7am.

“Like most capital cities, in order to promote tourism, attract and support businesses, creating a vibrant and unique sense of place, this requires a healthy and robust 24-hour economy.”

Table 4.1 Average Traffic Volumes Per Hour*

ROAD / STREET NAME	TRAFFIC COUNTER DETAIL (TRAFFICMAP.COM.AU)	TRAFFIC VOLUMES AT 6AM	TRAFFIC VOLUMES AT 7AM	TRAFFIC VOLUME % INCREASE
Wellington Street	West of Milligan Street	833	1,416	70%
Murray Street	West of Milligan Street	348	686	97%
The Esplanade	East of William Street	1,167	1,795	54%
Beaufort Street	South of Roe Street	504	868	72%
Aberdeen Street	East of Beaufort Street	181	342	89%
Francis Street	East of William Street	37	85	130%
James Street	East of Beaufort Street	78	176	126%
Royal Street	West of Brook Street	145	483	233%
Hay Street (Westerly Direction)	West of Havelock Street	523	958	83%
Hay Street (Westerly Direction)	East of Hill Street	121	245	102%
Baker Road	West of Thomas Street	39	137	251%

*Data obtained by LGA from Main Roads Traffic Map Website Hourly Data

Waste collection and street cleaning services are structured to times that best suit the activity in individual areas, whilst minimising the impact on stakeholders, however a level of disruption is unavoidable.

5. Works Description and Controls

5.1 Waste Collection

The collection of waste includes kerbside collection and within dedicated undercover car park areas. Noise emissions within undercover car parks are well contained and usually do not affect noise-sensitive receivers.

With kerbside collections, bins are located on the kerb, grouped in a specific bin area or moved to the kerbside by City of Perth personnel. Bins are then wheeled to the back of the truck and emptied. Compaction of waste generally occurs immediately to ensure the vehicle is ready for the next waste collection.

To address the impact from domestic and commercial rubbish collection to noise-sensitive receivers the following will be implemented:

- Waste collection trucks to be fitted with lifting/compaction system with sound power level not exceeding 90 dB(A),
- All plant fitted with smart broadband reversing alarms,
- Strata management companies or businesses having large volumes of glass will be notified that glass is to be separated from other waste and will be collected during the day where practicable.

5.2 Cleaning of Roads, Footpaths and Public Places

Roads, public places and footpaths are cleaned following a specific schedule and use a variety of equipment including road sweepers, footpath sweepers and manual blowers.

Road and footpath sweepers generally travel uninterrupted along their designated route to the next scheduled section. With footpath cleaning, it is sometimes required for a section to be cleaned

several times to achieve a suitable outcome. Footpath and road cleaning is also very seasonal in areas with deciduous trees or shrubs.

For large public places e.g. Forest Place, cleaning will generally involve several machines at once in the area to maximise cleaning efficiency and minimise cleaning time.

To address the impact from the cleaning of roads, footpaths and public places to noise-sensitive receivers, the following will be implemented:

- All plant fitted with smart broadband reversing alarms,
- At night-time and where practicable, road sweepers will be operated in standard operating mode and the use of the 'boost mode' will be minimised. In some cases, however, it may be preferable for the road sweeper to be operated in 'boost mode' to prevent having to come back to the same area several times, therefore minimising the overall noise exposure,
- Pavement cleaning using the high-pressure water handgun is minimised near noise-sensitive premises,
- All cleaning activities scheduled so that occurrence of works is minimised at night-time, however, works may be required to occur due to unforeseen circumstances or scheduled public events in specific areas,
- Where practicable, hand-held leaf blowers will be used with 'throttle lock' to provide constant engine speed while cleaning, therefore minimising potentially annoying characteristic of 'modulation' associated with the up/down revving of engine.

5.3 City of Perth Policies

Where possible, City policies should take into account the Capital City environment, where noise is generated by a 24-hour economy. For example, policies could consider the following to directly or indirectly assist with addressing the noise impacts from essential services:

- New multi residential developments need to consider ambient noise and therefore include acoustic treatments (such as double/triple glazing) to external facade elements which minimise noise intrusion,

- Property titles to include acknowledge of City living and 24-hour noise levels.

Additionally, policies could consider the following to directly or indirectly assist with addressing the noise impacts from essential services:

- Purchasing policies to consider Work Health and Safety perspectives and Environmental factors,
- Adopting a buy quiet policy for future equipment.





6. Impacted Areas

AREA CLASSIFICATIONS:

- High Traffic areas - include roads that have a high degree of connectivity with traffic volumes of up to 8,000 vehicles per day. Primarily Distributor A and B with minimal local distributor and local access roads.
- Entertainment Areas - These areas include businesses such as small bars, breweries, nightclubs, late night fast food outlets which generate significant activity outside normal operating hours. These businesses can open as early as 6am and close as late as 4am which can indirectly result in high volumes of litter in the surrounding streets.
- Daytime Dining Strips - These areas include multiple businesses along one specified road which often include outdoor dining. These businesses can operate any time from 6am until midnight.
- Medium Traffic Areas - include roads that have a high degree of connectivity with traffic volumes of up to 6,000 vehicles per day. Primarily Distributor A and B with numerous connecting local distributor and local access roads.

Weeknights

Where the aforementioned classifications all occur within close proximity, these areas have waste collection and street cleaning conducted by nightshift to ensure minimum impact to businesses, vehicular traffic, pedestrian traffic and staff safety. Areas are scheduled around business operating hours whilst also achieving productivity. These areas primarily include Northbridge and the Perth CBD.

Weekdays

Outside of Northbridge and the Perth CBD, in certain locations, high and medium traffic occur with restaurant strips or are impacted by clearways. These areas have waste collection and street cleaning conducted by dayshift, where possible, to reduce noise impacts to noise-sensitive receivers. However, to ensure minimum impact to businesses, vehicular traffic, pedestrian traffic and staff safety they are serviced prior to 7am. Again, areas are scheduled around business operating hours whilst also achieving productivity. This includes areas such as Hay Street in West Perth and Adelaide Terrace in East Perth.

Weekends

Waste collection on the weekend is minimised to primarily public litter bin collection, as well as commercial waste collection where businesses run seven days (hotels, restaurants etc).

The majority of these businesses are located in Northbridge and the CBD.

Street cleaning is required to be dynamic across the weekend to ensure litter is removed quickly following businesses closing between midnight and 4am. These businesses can indirectly cause large amounts of litter from their patrons upon entering and leaving venues. To prevent this litter becoming windblown or attracting vermin, these areas must be cleaned immediately, prior to 9am. This also ensures the City is 'business ready' prior to normal weekend operating hours and businesses serving breakfast.



7. Operators Training

7.1 Waste Collection

Operator training is required for all operators of waste collection vehicles before commencing specified works under this plan. Operators will undertake Driver Assessments to ensure they display defensive driving techniques in noise-minimising braking, accelerating and bin emptying techniques. Additionally, noise minimisation measures will be communicated at toolbox meetings and documented on notice boards to constantly remind operators of their obligations whilst conducting collections during prescribed times.

In relation to noise minimisation, the City will implement additional training which will focus on noise mitigation and include as a minimum:

- Waste collection routes to minimise noise impacts,
- Compaction zones,
- Reducing accelerating and braking noise,
- Quiet bin lifting techniques,
- Engaging with residents and responding to complaints,
- Inspecting equipment for excessive noise,
- All operators are required to undergo vehicle and equipment training on commencement followed by annual refresher training.

7.2 Cleaning of Roads, Footpaths and Public Places

Operator training is required for all operators of street cleaning vehicles before commencing specified works under this plan.

In relation to noise minimisation, the City will implement additional training which will focus on noise mitigation and include as a minimum:

- Street cleaning routes to minimise noise impacts,
- Plan various modes of operation and impact on noise emissions,
- Engaging with residents and responding to complaints,
- Inspecting equipment for excessive noise,
- All operators are required to undergo vehicle and equipment training on commencement followed by annual refresher training.

8. Community Information

Community information regarding the works carried out under this plan will be accessible on the City's website, with its link communicated to all permanent occupiers potentially affected by noise from the works via their rates notices or other City publication. Hardcopies of the ESNMP are available on request.

The information provided will include:

- a brief description of the works,
- where the ESNMP can be accessed,
- a schedule of the works,
- how to lodge comments or complaints about the works,
- the duration of the current ESNMP approval, the date of the next review and how to make a submission.

9. Complaints Response

All noise complaints regarding 'out-of-hours' waste collection and street cleaning essential services within the City of Perth boundaries carried out under this plan, will be recorded and investigated by the Waste and Cleaning Unit or delegate. This process will follow the City's complaint procedure, including notifying the City's Environmental Health Department.

Noise complaints can be lodged with the City in writing, in person, via email or via the online noise complaint form, published on the City's website.

The complainant will be advised in writing of the outcome of an investigation. Wherever practicable, work schedules and routes of travel will be modified/adjusted to address any adverse impacts to the amenity for stakeholders.

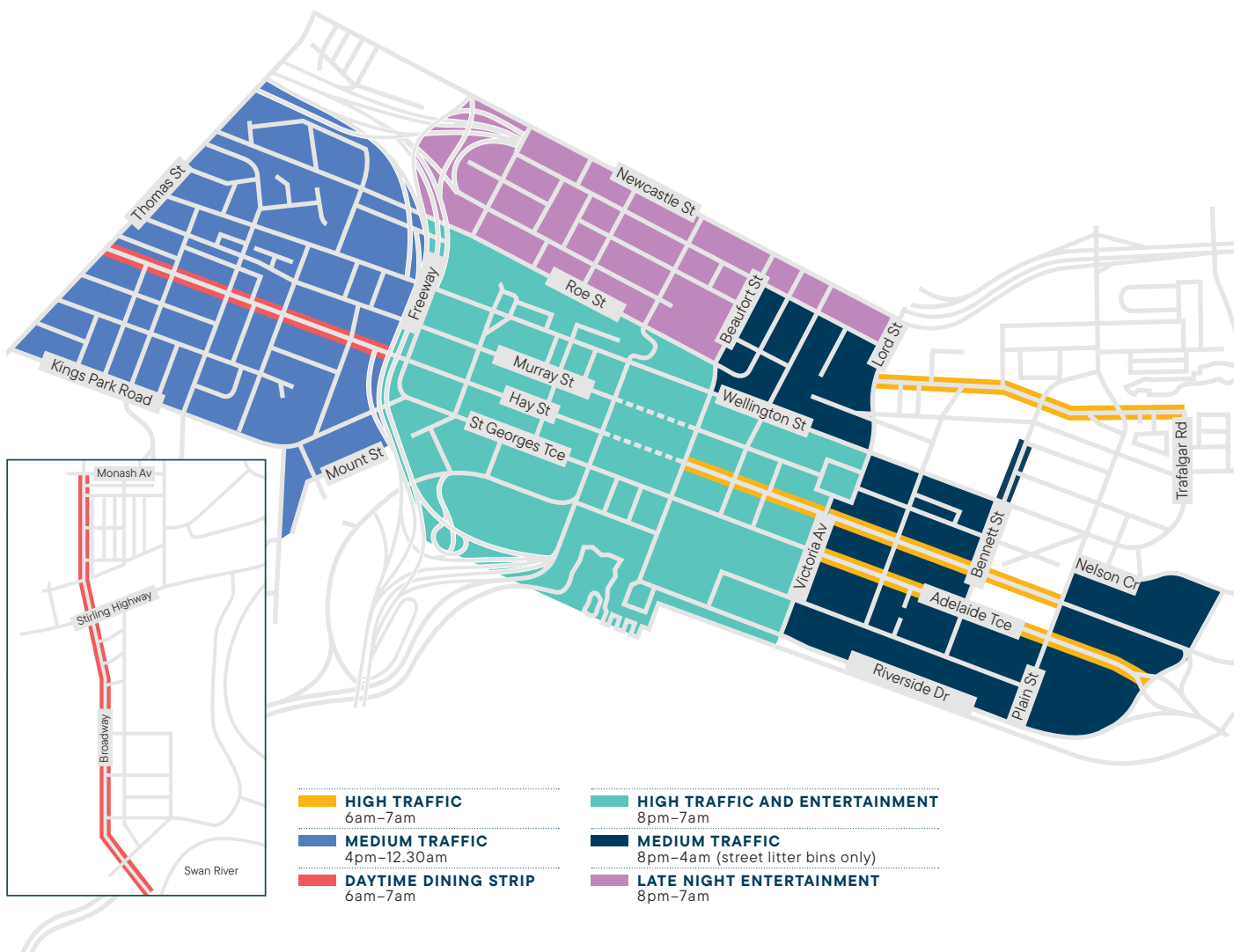


Appendix A:

City of Perth Street Cleaning and Sanitation 'Out-of-Hours Works' Maps

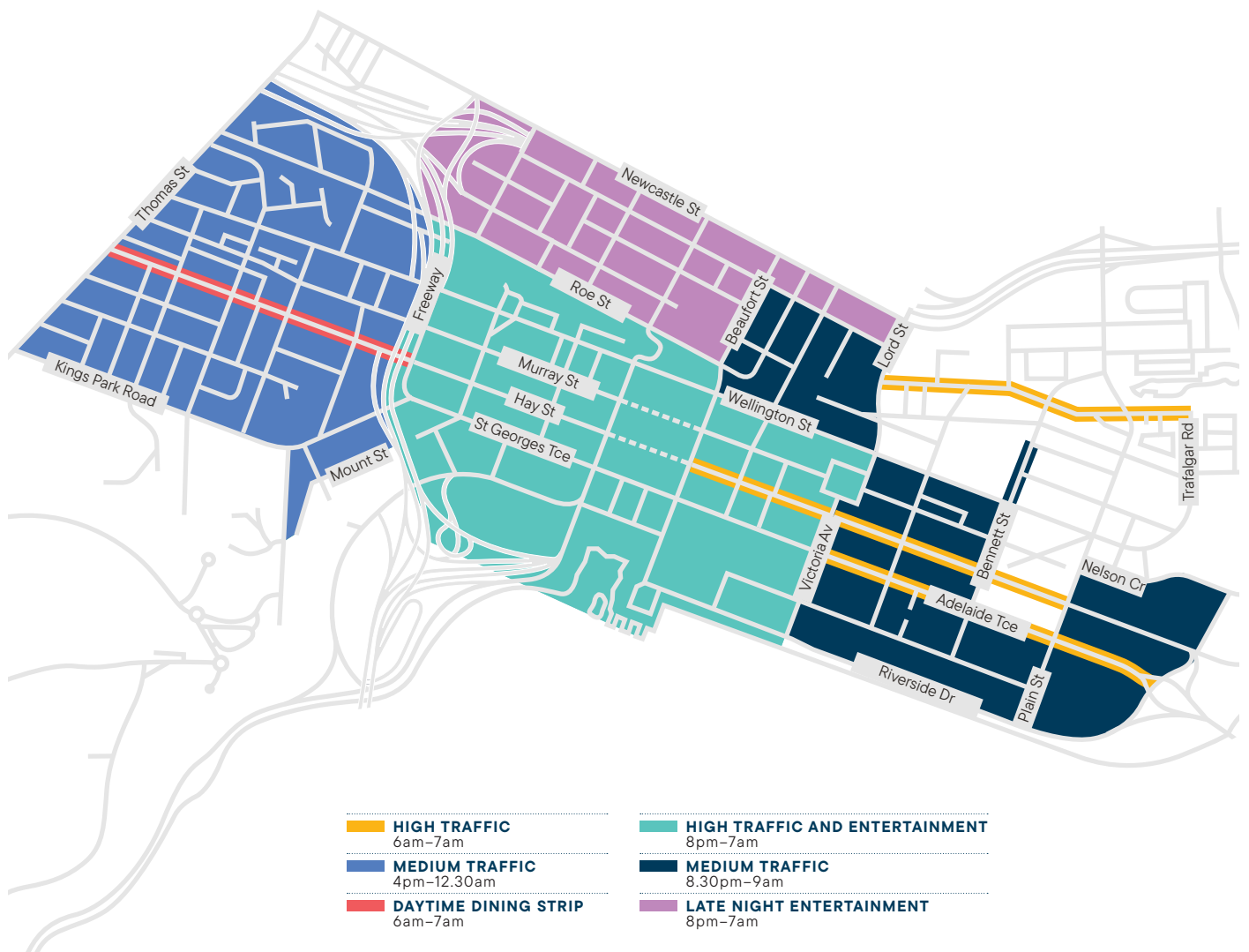
WEEKDAYS

from Sunday 7pm until Friday 7am



WEEKENDS

from Friday 7pm to Sunday 9am





Appendix B:

Terminology

The following is an explanation of the terminology used throughout this report.

Noise-Sensitive Receiver

A noise-sensitive receiver is a premise occupied solely or mainly for residential or accommodation purposes, including hospitals, places of public worship, and aged care.

Decibel (dB)

The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A- Weighting

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as LA dB.

Sound Power Level (Lw)

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly

measured using a sound level meter but is calculated based on measured sound pressure level at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (Lp)

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc. and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

L_{Amax} assigned level

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded at any time.

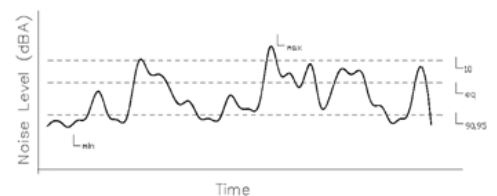
L_{A1} assigned level

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 1 percent of the representative assessment period.

L_{A10} assigned level

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 10 percent of the representative assessment period.

Chart of Noise Level Descriptors



TYPICAL NOISE LEVELS





This publication can be requested in alternative formats: audio, braille, Word or accessible PDF.



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