# Australian Litter Measure (AusLM) Field Manual

Version 4.0

Sustainability Victoria

VICTORIA State Government

Produced by Sustainability Victoria in conjunction with NSW EPA and the QLD government, in consultation with all states and territories.

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Australian Litter Measure Evaluation Framework


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**Accessibility**
This document is available in PDF and Word format on the internet at sustainability.vic.gov.au

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| 1.3 | Revised draft after Vic Metro pilot | 6/1/2021 |
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**Who should read this manual:**

- People employed or contracted to undertake litter monitoring through the official AusLM litter monitoring program across Australian States & Territories.
- Local Government, land managers, community groups and citizen scientists who want to use the AusLM method to better understand the extent of litter at one or more locations.

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- The AusLM Project Working Group (PWG) members representing State or Territory Government for each jurisdiction:
    - Australian Capital Territory - Gayan Ratwatte & Jordan Pye, ACT NoWaste.
    - New South Wales - Rupert Saville & John Lavarack, Department of Planning, Industry and Environment.
    - Northern Territory - Christine Tylor & Evana Coote, Department of Environment and Natural Resources.
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**Licencing**

# 1 Introduction

The Australian Litter Measure (AusLM) provides a transparent, consistent and simple approach to measuring the extent of litter in the environment. The method was designed for use in an official litter monitoring program involving all Australian States and Territories. The method can also be used by other groups such as local governments or citizen scientists who want to better understand the extent of litter at sites and locations of specific interest to them.

**What is litter?**

There are many different definitions of what constitutes litter. For AusLM, when everyday items such as packaging, drink containers, paper and cardboard are not disposed of correctly and they enter the environment they become littered items.

**Why is litter an important problem?**

Every year governments, land managers and community members invest thousands of hours and millions of dollars managing and cleaning up litter. If disposed of correctly, littered items could often be recycled and turned into new products which reduces the need to mine new resources. Litter ruins the amenity of our public places and certain litter items can create serious harm to humans, plants, animals and the natural environment.

**About this manual**

This manual is your step-by-step guide to implementing the AusLM. Your role, as a surveyor will involve traveling to specific locations where you will count and categorise litter items you find within specific sites. You will enter the data collected into a database where it can be analysed to generate reports that will help decision makers:

1. Understand if the litter situation is changing;
2. Assess if litter prevention policies are effective in reducing litter; and
3. Design more effective and targeted litter prevention policies and programs.

Before learning more about AusLM and your role as a surveyor, it is important for you to understand some common terms used in this guide.

| | | |
|---|---|---|
|  | **What is a location?** | A location is either a city, town or a local government area within a city. |
| | **What is a site?** | A site is a broad area of interest where the extent of litter will be measured. Sites are categorised into one of six ‘site types’ which describe the characteristics of the site. For example, a site might be a local public park or a number of streets in a residential housing area. A main road and retail shopping area are examples of site types. |
| | **What is a transect?** | A transect is a defined area within a site where the litter will be counted. |

**What does an AusLM surveyor do?**

AusLM litter surveyors are required to perform the tasks summarised in Figure 1 below.

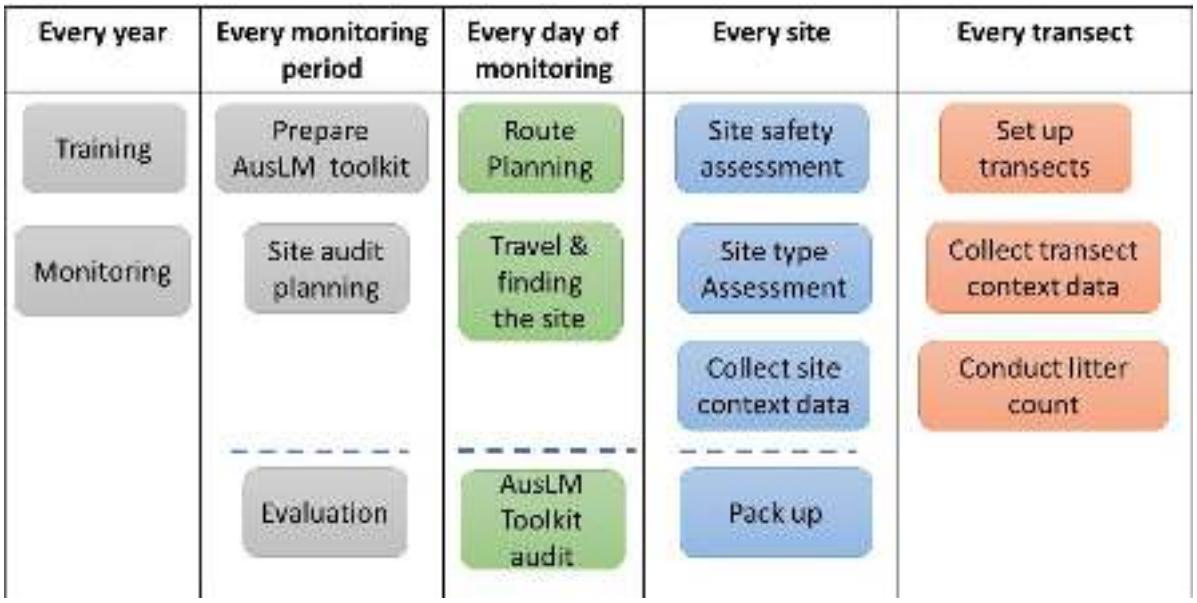



Figure 1. AusLM surveyor tasks

A brief overview of these tasks is described below to help set the scene for the work you will be undertaking.

**Every year:**

- **Training:** Surveyors involved in the official AusLM Monitoring Program are required to participate in some form of training on an annual basis to refresh knowledge about AusLM and help ensure the methodology is applied in an accurate and consistent manner.
- **Monitoring:** Every year you are most likely to engage in one or more monitoring periods which will involve conducting all the other tasks in the table.

**Every monitoring period**[1]

- **Prepare AusLM toolkit:** Surveyors will need to update, create or be supplied with a toolkit of items and materials needed to support the implementation of AusLM in the field. (See Section 3.1 Preparing the AusLM toolkit)
- **Site audit planning:** Surveyors are provided with a list of sites to audit each year. They need to plan what sites will be audited on which days to assist in their planning. (See Section 3.2 Site audit planning)
- **Evaluation:** After all sites have been audited, surveyors will complete an evaluation survey/interview to share their experience and help improve AusLM. (See Section 3.3 Evaluation)

[1] For the official AusLM monitoring program, a monitoring period refers to a block of weeks where litter count work is undertaken. Litter monitoring will commonly occur either annually, 6-monthly or quarterly. Other groups may choose weekly or monthly monitoring periods.

**Every day of monitoring period**

- **Route Planning:** Taking note of local traffic conditions, surveyors should plan the route for the day to visit all the assigned sites in the most efficient manner possible. (See Section 4.1 Route Planning)
- **Travel and finding the site:** Surveyors will need to travel to each site allocated to them. (See Section 4.2 Travel and finding the site)
- **AusLM Toolkit audit:** At the end of each day surveyors should complete the AusLM toolkit checklist to make sure the toolkit has the required items ready for the next day in the field. (See Section 4.3 AusLM toolkit audit and 0 AusLM Toolkit Checklist)

**Every site**

- **Site Safety Assessment:** A site safety assessment must be completed before work starts at a site. (See Section 5.1 Site Safety Assessment)
- **Site Type Assessment:** Surveyors will complete a Site Type Assessment to make sure the site meets the required criteria to be classified as the site type assigned to the site by the AusLM management team. (See Section 5.2 Site Type Assessment)
- **Collect site context data:** General information about the site (site context) needs to be collected. (See Section 5.3 Collect site context data)
- **Pack up:** Complete any data entry, pack up the toolkit and prepare to move to the next site. (See Section 5.4 Pack up)

**Every transect**

- **Set up transects:** A transect is a clearly defined area within a site where litter will be counted. Each site has three or more transects. At some sites you are required to mark out the transect location. (See Section 6.1 Set up transects)
- **Collect transect context data:** Surveyors will collect information about the transect (transect context) such as the transect length and width. (See Section 6.2 Collect transect context data)
- **Conduct litter count:** Surveyors will perform a litter count within the transect area. (See Section 6.3 Conduct the litter count)

Whilst there may appear to be a lot of steps, the process is simple and straightforward once you are familiar with it. A list of steps to remind you of what to do at each site and transect is provided in Section 0. You should print this checklist and stick it to your AusLM clipboard as a convenient reminder.

The next sections of the guide will provide some foundation knowledge needed to be an AusLM surveyor. After the foundation knowledge has been described, there will be more detail on the key tasks mentioned above that surveyors need to understand and perform.

# 2 Foundation knowledge

## 2.1 Understanding AusLM site types

AusLM has been designed to count litter at certain types of sites. AusLM site types include a number of common types of land use in Australia which are good examples of areas in which people are likely to litter or experience litter. A summary of the AusLM site types is presented in Table 1.

Table 1. Site type summary

| Site type | Simple description |
|---|---|
| **Beach** | A mostly sandy beach frequently visited by people for activities such as swimming, walking, other recreation and relaxation. |
| **Residential area** | A street/collection of streets in a residential area. The street has homes, units, or apartments on both sides of the street. |
| **Industrial area** | A street/collection of streets in an industrial area. |
| **Retail area** | A street/collection of streets within a retail precinct (i.e. shopfronts). |
| **Recreational Park** | A public outdoor park mostly covered by grass and frequently visited by individuals and families for recreation and leisure activities. |
| **Main roads** | Straight open stretches of sealed road with wide verges. Roads that typically act as an arterial for traffic between and around population centres. |

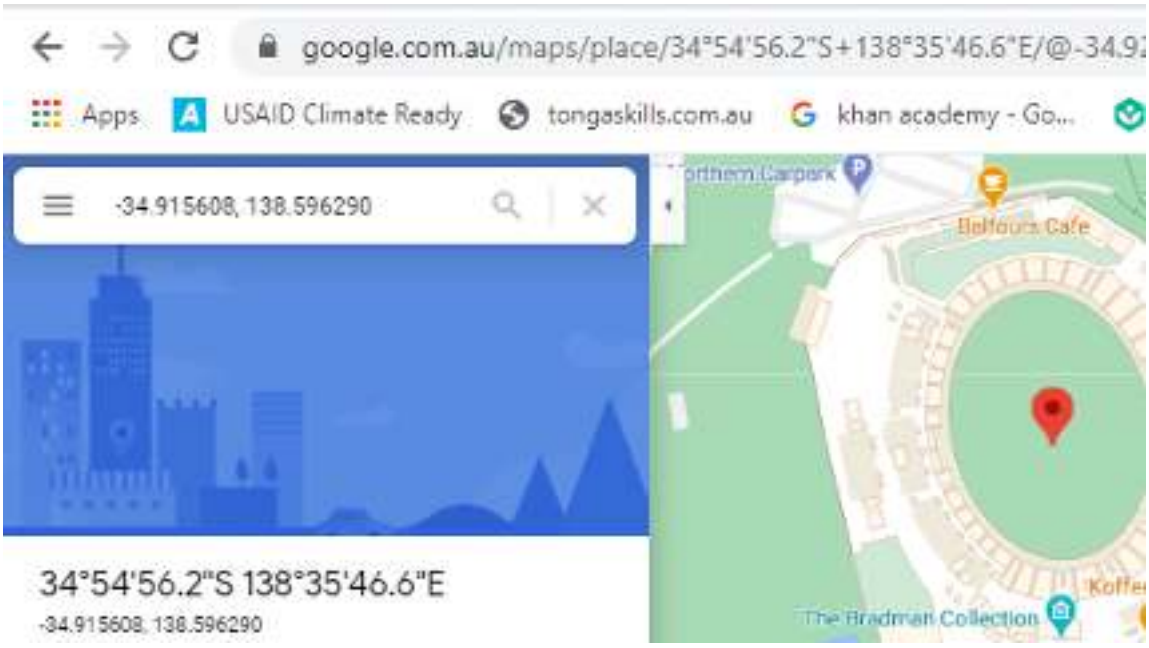
## 2.2 Understanding GPS coordinates

Global Positioning System (GPS) coordinates record the location of a specific point on the earth. You will need to be able to read, enter and use GPS coordinates to complete your field work. You will be required to capture GPS coordinates for transect start and end points the first time a site is audited. End points are not provided for beach sites and are optional for recreational park sites.[2] This data is used to help verify the site has been set up correctly.

A quick summary of things you need to know about GPS coordinates is presented below.

**GPS coordinates overview**

- GPS coordinates are generally represented in one of three common formats.
- AusLM uses the Decimal Degrees (DD) format. Numbers may be positive or negative and will contain many decimal places. It is important to enter or record at least six decimal places for an accurate reading.
- Each GPS coordinate contain two numbers:
    - Latitude – Think of it as the vertical position. Example: -34.915608
    - Longitude – Think of it as the horizontal position. Example: 138.596290
- When taking a GPS reading, also capture the GPS accuracy which is shown as plus or minus and specific number of metres. Example: +/- 3 metres.
- You can locate and navigate to a GPS point by entering the coordinates into a Google Maps (or similar) search box in the following format: Latitude, Longitude. The image below shows the entry of the following GPS coordinates. -34.915608, 138.596290. You could then use the Maps App to navigate to the location represent by the red pin.




[2] A compass bearing combined with end point description may be sufficient to navigate to the end point at recreational park sites.

## 2.3 Safety

Keeping everyone safe from accidents and injury is a high priority for the AusLM Project. A detailed risk assessment has been undertaken to identify potential hazards you may be exposed to out in the field conducting litter counts. The hazards and recommended measures to eliminate or minimise risks are documented in Annex 0 Hazard risk matrix. A summary of the hazards are documented in the Site Safety Assessment Checklist (Annex 0) and this can be used as a quick reference when undertaking your Site Safety Assessment.

Important contact phone numbers in case of emergency:

- Fire, police, ambulance: **000**
- AusLM Project management: _____
- Hospital/medical facility for locations where the surveyor is working:

  _____

## 2.4 Data collection and entry

AusLM uses three paper forms to collect data about the sites, transects and the number of litter items that are counted:

1. Site Information form
2. Transect Information form
3. Transect Litter Count form

Electronic versions of these forms have been created which enable you to capture data directly without using paper forms, or to enter data captured on paper forms into a database. There are three main approaches to data collection and entry as outlined in Table 2 below with hybrid electronic and paper forms collection being the recommended approach.

Table 2. Approaches to data collection and entry

| Data capture method | Description |
|---|---|
| **Hybrid electronic and paper forms** | Site and transect information are captured and entered directly using electronic forms using either a mobile phone/tablet App or electronic forms supported by a web browser. Transect litter count data are captured on a paper form and then later enter it into electronic forms. **This is the recommended approach.** |
| **Paper only** | All data are captured on the three paper forms. Later, data on the forms is entered into a database using electronic forms (mobile/tablet App or web browser). |
| **Electronic forms only** | All data is captured and entered directly using electronic forms using either a mobile phone/tablet App or electronic forms supported by a web browser. **This approach is not recommended with the existing approach of having only one surveyor audit a transect** as entering data directly into the Transect Litter Count form may be inefficient and may create the opportunity for data errors through accidental data entry whilst auditing a transect. **It may be an appropriate approach if there are two surveyors auditing a transect where one surveyor is only responsible for data entry.** |

The team of people managing your litter monitoring program will have access to additional electronic forms (Location, Site definition, Surveyors) to add foundation data required to support your auditing work.

Instructions on how to complete the paper version of the three forms of interest to surveyors is provided in the relevant sections of this manual. A brief overview of collecting data using either a mobile phone/tablet App or web forms is documented in Annex 9 Electronic data entry.

**The next sections of this manual describes each of the specific tasks listed in the earlier introduction. These tasks are grouped under broad headings related to when they are to occur:**

- **Every monitoring period**
- **Every day**
- **Every site**
- **Every transect**

# 3 Every monitoring period

For the official AusLM monitoring program, a monitoring period refers to a block of weeks where litter count work is undertaken. Litter monitoring periods will commonly occur either annually, 6-monthly or quarterly. Other groups may choose weekly or monthly monitoring periods.

## 3.1 Preparing the AusLM toolkit

At the start of each monitoring period, you will need to assemble an AusLM toolkit to support your field work. If you have a toolkit from previous monitoring periods, then you should review the AusLM toolkit checklist (See Section 0) and purchase the missing items. If you do not already have an AusLM toolkit assembled, then consult the AusLM Toolkit Buying Guide (separate document) to purchase and prepare all the items you need.

## 3.2 Site audit planning

Every monitoring period you will be provided with a list of sites to audit. You will need to determine how many sites you can audit each day whilst taking into consideration:

- daylight hours that provide good visibility for litter surveying
- distance between sites and between locations.

The plan you develop should document which sites will be audited on each day. For each site you should have the following details: site name, site identification number (ID), approximate street address and GPS coordinates. These details should be provided to you in an Excel spreadsheet called the Site List spreadsheet. If your list of sites include a Main Road type of site, then you should identify the road manager for that road and seek their permission to conduct the litter count. Permits or authorisation may be required.

## 3.3 Evaluation

Evaluation is an important activity that supports the continuous improvement of AusLM and ensures that lessons learnt in the field are documented and applied in future monitoring periods. At the end of the monitoring period, after all sites have been audited, you will be asked complete an evaluation survey or interview to share your experience and help improve AusLM. Survey and interview tools have been documented in a separate AusLM Evaluation Framework document.

# 4 Every day

## 4.1 Route Planning

On a daily basis you should plan your travel route for visiting each of the allocated sites for the day. The weather, local traffic conditions and specific site timing requirements may influence decisions you make. For example, **beaches are to be surveyed within a timeframe between 2-hours before or after low tide**, and this consideration may influence the order of when you audit these and neighbouring sites.

## 4.2 Travel and finding the site

You will require access to a vehicle or appropriate transportation to travel to your allocated sites. You should print a copy of the Site List spreadsheet and your plan for auditing the sites for referencing throughout the day. It is recommended you **download the Site List spreadsheet to your phone/tablet device.** A Google Earth satellite image showing the location of your site within the broader town/local government area should also be produced by the AusLM Management team and be made available to you. You should also print a copy of these map

images as they can provide a general guide as to where your site and the transects are located. There are two easy techniques help you navigate to a site.

**1. Basic navigation using the Site List spreadsheet:**

1. Open the Site List spreadsheet on your phone/tablet.
2. Click on the Map link for the first site. This will open Google Maps and allow you to navigate to the site.
3. As a back-up, you can manually enter the street address or GPS coordinates into a Google Maps (or similar) search box.
4. If there are issues using online map navigation software, then the Site List also contains approximate street addresses that can be used to locate the site. A hardcopy printout of the satellite image showing site location may also assist you to navigate to the site.

**2. Site Finder form:**

1. Android mobile phone users with Field Task installed can open the FieldTask App on their device. Other users can log onto the SMAP website (https://sg.smap.com.au) and navigate to the Modules -> Web Forms menu.
2. Open the Site Finder form.
3. Select your state and then select the site you are travelling to.
4. Scroll down to see site address, parking notes, site notes and then click the 'Open URL' button (or maps hyperlink). This will open Google Maps and allow you to navigate to the site.

**Arriving at the site**

When you arrive at the site, find a safe and legal place to park as close to the site as possible. The Site Finder form in FieldTask or SMAP will show you details about any recommended parking locations for your site.

For Main Road sites, follow the extra safety guidance provided in Section 0 to safely pull over and park on the side of the road.

Update the *Site notes* field on the Site Information form if you find a new or better parking location.

| | | |
|---|---|---|
|  | **What if I can't find the site?** | Double check you have entered the correct street address or GPS coordinates for the site. If you are still unable to locate the site, then call your AusLM supervisor and ask for guidance. If the problem cannot be resolved, inform your supervisor and move on to the next site. |
| | **What if I can't find any safe locations to pull over on a main road?** | Continue driving until you can pull over, or turn off onto a side road and find a safe place to pull over. Consider if it is possible to walk back to the road and set up your site, or find a safe spot on the opposite side of the road. If no safe place can be found, then notify your supervisor and request a replacement site. |

## 4.3 AusLM toolkit audit

At the end of each day, you should complete the AusLM toolkit checklist (Section 0 AusLM Toolkit Checklist) to make sure the kit has the required items ready for the next day in the field. If supplies of any consumable items are getting low, then you should order replacement items.

# 5 Every site

## 5.1 Site Safety Assessment

Before starting any litter audit work at a site, you need to conduct a Site Safety Assessment to ensure the site is safe for you and those around you to work at. Refer to the Site Safety Assessment checklist (Section 0) to identify common and site-specific hazards that might pose a risk to your safety. You should also comply with any additional department or organisation specific safety procedures.

**If hazards are identified, then you must perform the relevant control or mitigation actions** described in the Hard Risk Matrix (Annex 0) to address the hazard. If the risk posed by the hazard cannot be eliminated or significantly reduced, then you should call the AusLM supervisor for advice. A decision to reschedule the audit or to choose a replacement site to audit may need to be made.

**Only start auditing work at a site if it is safe to do so.**

Main roads pose additional risks that need to be understood and managed. Additional safety measures for main roads are outlined in Section 0.

**No work should be undertaken on main roads without informing relevant road authorities and obtaining any required permits.**

## 5.2 Site Type Assessment

Each site type recognised by AusLM has a list of criteria the site must meet for it to be included in the AusLM monitoring program. Each site type also has a list of criteria that may exclude a site from the monitoring program.

| **Why conduct the Site Type Assessment?** |
| --- |
| You will recall that AusLM recognises six different site types: residential, retail, industrial, park, beach and main road. Site inclusion and exclusion screening is performed upon the initial selection of sites for AusLM, however, sites may change over time and these changes may result in the site not meeting the necessary inclusion criteria or triggering one of the exclusion criteria which would result in the site being removed from the AusLM monitoring program. For example, over time, an industrial site may be redeveloped into residential housing which would mean the industrial site no longer meets the inclusion criteria and would be removed from the AusLM monitoring program. |

The Site Type Assessment task helps you check that the site still meets the inclusion criteria for the specific site type and does not trigger any of the exclusion criteria defined for the site type.

Use the Site Type Assessment checklist to:

1. locate the specific table for the site type that you are auditing
2. test if the site meets **all** of the inclusion criteria
3. test if the site triggers **any** of the exclusion criteria

After completing the above tests, you need to provide a pass or fail judgement and update the *Site type assessment* checkbox on the Site Audit form. Conditions for a pass and fail rating are provided below:

- **Pass:** All inclusion criteria were met and no exclusion criteria was triggered.
- **Fail:** One or more of the inclusion criteria were not met or one or more exclusion criteria was triggered.

If the site fails the Site Type Assessment, then you should still audit the site. A replacement site will likely be provided in future monitoring programs.

## 5.3 Collect site context data

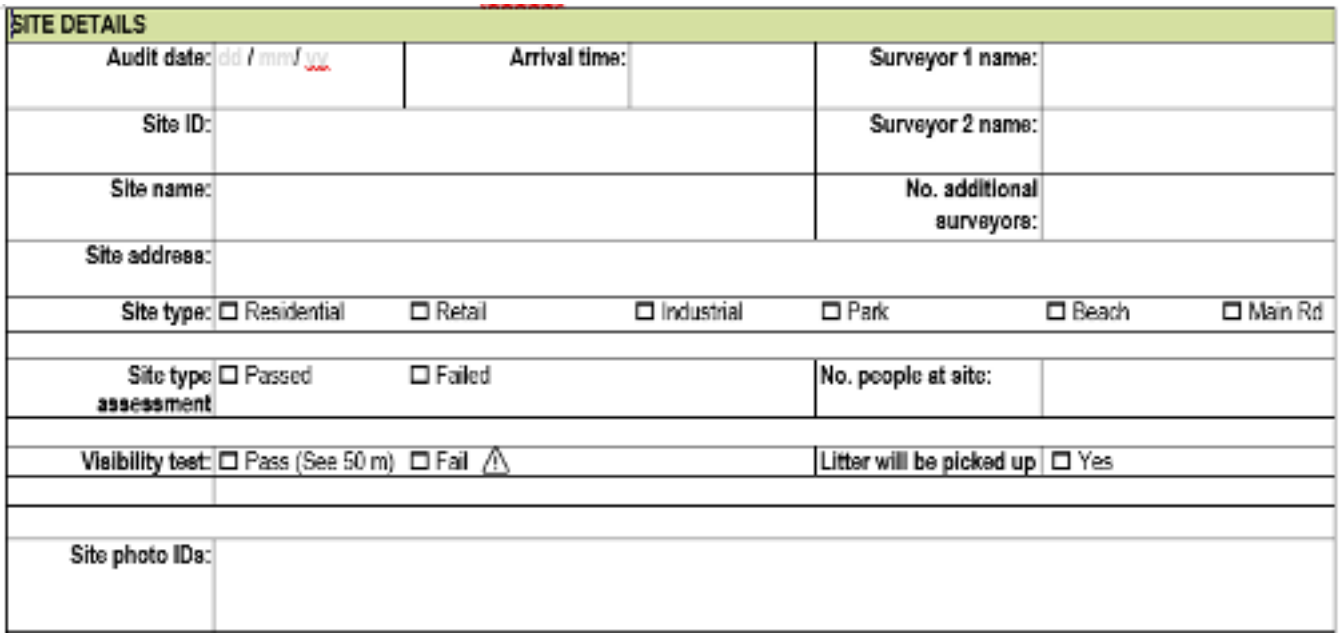
You are required to capture some basic data about the site you are auditing. This ‘site context’ data can help with the later analysis of the litter count data. Site context data is captured at two different times during the audit process:

1. At the start before the audit
2. At the end after all the transects have been audited

More details about what data to capture at the start and end of your auditing work is provided below.

### 1. At the start before auditing has started

If using paper AusLM forms to collect site data, complete the *SITE DETAILS* section of the AusLM Site Audit form before litter auditing starts. This section of the paper form is presented below in Figure 2. If using electronic AusLM forms in FieldTask or SMAP to collect site data, then you will complete the Site Information Start form. Additional guidance on the fields and how to complete the form is provided in Annex 0 Completing the Site Information Form.

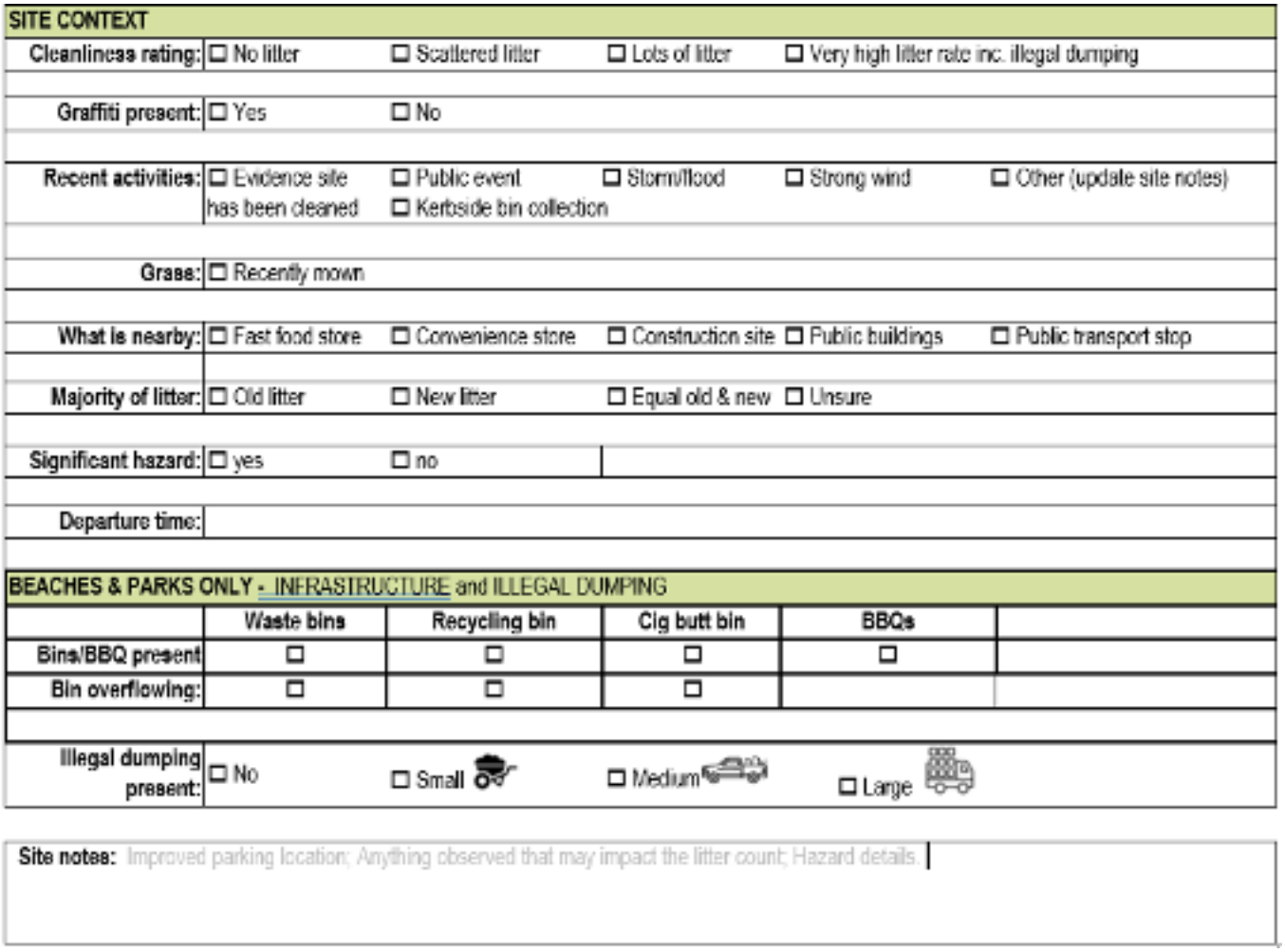


| SITE DETAILS | | | | | | |
|---|---|---|---|---|---|---|
| Audit date: | dd / mm/ yy | Arrival time: | | Surveyor 1 name: | | |
| Site ID: | | | | Surveyor 2 name: | | |
| Site name: | | | | No. additional surveyors: | | |
| Site address: | | | | | | |
| Site type: | ☐ Residential | ☐ Retail | ☐ Industrial | ☐ Park | ☐ Beach | ☐ Main Rd |
| Site type assessment | ☐ Passed | ☐ Failed | | No. people at site: | | |
| Visibility test: | ☐ Pass (See 50 m) | ☐ Fail ⚠ | | Litter will be picked up | ☐ Yes | |
| Site photo IDs: | | | | | | |

Figure 2. SITE DETAILS section of the Site Information form

### 2. At the end after all the transects have been audited

If using paper AusLM forms to collect site data, complete the *SITE CONTEXT* section of the AusLM Site Audit form after all transects have been audited. This section of the paper form is presented below in Figure 3. If using electronic AusLM forms in FieldTask or SMAP, then you should open and complete the Site Information End form. Additional guidance on the fields and how to complete the form is provided in Annex 0 Completing the Site Information Form.



| SITE CONTEXT | | | | | |
|---|---|---|---|---|---|
| Cleanliness rating: | ☐ No litter | ☐ Scattered litter | ☐ Lots of litter | ☐ Very high litter rate inc. illegal dumping | |
| Graffiti present: | ☐ Yes | ☐ No | | | |
| Recent activities: | ☐ Evidence site has been cleaned | ☐ Public event<br>☐ Kerbside bin collection | ☐ Storm/flood | ☐ Strong wind | ☐ Other (update site notes) |
| Grass: | ☐ Recently mown | | | | |
| What is nearby: | ☐ Fast food store | ☐ Convenience store | ☐ Construction site | ☐ Public buildings | ☐ Public transport stop |
| Majority of litter: | ☐ Old litter | ☐ New litter | ☐ Equal old & new | ☐ Unsure | |
| Significant hazard: | ☐ yes | ☐ no | | | |
| Departure time: | | | | | |

| BEACHES & PARKS ONLY - INFRASTRUCTURE and ILLEGAL DUMPING | | | | | |
|---|---|---|---|---|---|
| | Waste bins | Recycling bin | Cig butt bin | BBQs | |
| Bins/BBQ present | ☐ | ☐ | ☐ | ☐ | |
| Bin overflowing: | ☐ | ☐ | ☐ | | |
| Illegal dumping present: | ☐ No | ☐ Small | ☐ Medium | ☐ Large | |

Site notes: Improved parking location; Anything observed that may impact the litter count; Hazard details.

Figure 3. SITE CONTEXT section of the Site Information form

## 5.4 Pack up

After all of the transects have been audited, you should make final updates to the Site Information form, including any details to help improve the efficiency of future litter audits. For example, update parking notes with alternative closer or back-up locations. Pack up the AusLM toolkit making sure not to leave anything behind.

Ensure all forms (paper or electronic) have been completed. It is recommended that Site Information form and Transect Information form data be entered into the AusLM database whilst you are at the site. For cost and efficiency reasons, it may be better to enter Transect Litter Count form data at a later time.[3]

[3] Deferring litter count data entry until surveyors are back in the office or not travelling my reduce accommodation and per diem costs.

# 6 Every transect

## 6.1 Set up transects

A transect is a specific area within a site where the litter will be counted. Each transect has a start and end point. Instructions on how to find the start and end point of a transect are documented later in this section of the manual. The width and length of each transect will be recorded. Each site type recognised by AusLM has different rules and instructions to follow for:

- the number of transects to audit
- the location, layout and spacing of transects
- length and width of transects.

Information about the number of transects, their location, layout and spacing have already been decided. The length and width of transects for some site types are fixed and predetermined. In other cases, you will need to measure the transect width and length. Table 3 documents a summary of the transect characteristics for each site type. A more detailed explanation of how to set up transects for each site type is documented in Sections 0 to 0.

Table 3. Transect details summary for each site type.

| Site Type | T #- | Layout | Length | Width | Set-up | Audit process |
|---|---|---|---|---|---|---|
| **Residential** | 6 | A strip along the street. Transect pairs (1 & 2, 3 & 4, 5 & 6) are on opposite sides of the same street. | 100 m. | Measure between the outside edge of the gutter in the street to the property boundary which may be a fence.<br><br>*If there is no clear property boundary or the boundary is not uniform, resample and select another transect.* * | N/A | Walk in S-shape pattern between start and end-point counting litter across the entire transect, including the gutter.<br><br>If the transect width is 3m or less, then you can walk in a straight line down the middle of the transect and count litter on either side. |
| **Retail** | 3 | A strip along the street. A transect includes only one side of the street. | 100 m. | Measure between the far-side edge of the gutter in the street to the retail shopfront. * | N/A | Walk in S-shape pattern b/w start and end-point counting litter across the entire transect, including the gutter.<br>If the transect width is 3m or less, then you can walk in a straight line down the middle of the transect and count litter on either side. |
| **Industrial** | 3 | A strip along the street. A transect includes only one side of the street. | 100 m. | Measure b/w the outside edge of the gutter in the street to the property boundary which may be a fence. *<br><br>*If there is no clear property boundary or the boundary is not uniform, resample and select another transect.* | N/A | Walk in S-shape pattern between start and end-point counting litter across the entire transect, including the gutter.<br><br>If the transect width is 3m or less, then you can walk in a straight line down the middle of the transect and count litter on either side. |
| **Park** | 5 | Transects are parallel to each other & evenly spaced b/w the 1st and 5th transect. | Calculated by others using satellite image and GPS points. | 3 m. One and a half metres either side of the central transect line | Mark the start and end locations of each transect with a stake/flag. | Walk in a straight line between the start and end points, counting litter 1.5 m either side of your central path. A compass bearing may be used to navigate from the starting point to the end point. |
| **Beach** | 5 | Transects are parallel to each other and spaced every 25 m between the 1st and 5th transect. | Measure b/w start (back of beach) and end (2 m before water's edge) points. | 6 m. Three metres either side of the measuring tape. | Mark transect end at back of the beach with a stake. Run tape measure b/w end, perpendicular to back of beach, until start point, 2 m before the water's edge. Secure tape with tent peg. | From start point, 1.5 m out from the central tape. Walk towards the end point in a straight line, 1.5 m out from the central tape, counting litter 1.5 m either side of you (3m width). Repeat from the end to the start point down the other side of the tape. A compass bearing may be used to navigate from the starting point to the end point. Count litter 2 m into vegetation behind the end marker, but do not walk into this 2m area. |

| Site Type | T #~ | Layout | Length | Width | Set-up | Audit process |
|---|---|---|---|---|---|---|
| **Main road** | 6 | Transect pairs (1 & 2, 3 & 4, 5 & 6) are on opposite sides of rd. Virtual centreline is created 4m from edge of road | 100 m. | 3 m. 1.5 metres either side of centre line walked by the surveyor. | N/A | Start 4 m out from the road at the transect the transect start point. Walk in a straight line down the virtual centreline, counting litter 1.5 m either side of the centre line until you reach the end point. |

~ Number of transects for the site type.

* If the far-side edge of the gutter in the street is not clearly defined or visible, then measure and include 50 cm from the edge of the footpath out into the street.

## Finding the transect start and end points

There are a number of processes and tools that will help you find the start and end points of each transect within a site.

1. **Satellite image.** A Google Earth satellite image showing the site and location of each transect will be produced by the AusLM Management team and be made available to you. This map image provides a good guide as to where transect start and end points are located. Each transect start and end point is labelled and you can refer to any obvious distinguishing features such as roads, drive ways, trees or infrastructure to locate a position close to where you should start.
2. **Description.** A detailed description of specific features at the start and end point will help you locate the specific start/end point.
3. **Site List spreadsheet and clickable map link.** You can use the Site List spreadsheet to help you navigate to the start/end points of the transect. Each transect start and end point is presented on a separate row of the spreadsheet. Each row contains the GPS coordinates that are used to create a clickable map link that will help you navigate to the point. Where possible, an approximate street address is also provided.
4. **Site Finder form.** The FieldTask Site Finder form also enables you to display transect locations on a map. Follow the instructions for using the Site Finder form in Section 4.2, then also enter the transect number and scroll down to see the clickable map link or button for the specific transect.
5. **Photos.** Photos of each transect start and end points will be taken during the initial audit. These photos should be available on subsequent audits and contain surrounding or significant land marks to help you identify the location. If the FieldTask App is used to take these initial photos, then these photos can be marked up by placing an X or circle on the photo to highlight the specific point.[4]
6. **Compass.** A compass bearing may be used to guide you from a GPS start point towards an end-point. It has been proposed a compass bearing could be used for park and beach sites. The compass (or compass App) should be configured to use true north, not magnetic north.[5]

The satellite image and GPS coordinates combined with the street address (where available) will help you get very close to the transect start or end point. Surveyors auditing the same site in the next monitoring period will be able to exactly pinpoint the start end points by referring to the annotated photos.

[4] The current prototype mobile phone App has not been configured to display these images. These images taken from past monitoring periods can be displayed by logging into SMAP and searching for the Transect Information form (table) using the Analysis module.
[5] True north explanation: https://adventure.howstuffworks.com/survival/wilderness/true-north.htm#pt1

## 6.2 Collect transect context data

You are required to capture some basic data about each transect that is audited. This 'transect context' data can help with the later analysis of the litter count data. Transect context data is captured at different times during the audit process:

1. At the starting point of the transect and before any litter has been counted
2. At the end point of the transect
3. At the end after the transect has been audited[6]

More details about what data to capture at are provided below.

**1. At the starting point of the transect and before any litter has been counted.**

If using paper AusLM forms to collect transect context data, complete the top section and *START OF TRANSECT DETAILS* section of the AusLM Transect Information form. This section of the paper form is presented below in Figure 4. If using electronic AusLM forms in FieldTask or SMAP, then you will complete the Transect Information Start form.

At the starting point of the transect you need to take a photo looking towards the end of the transect. If this is the first time the site is being audited, then you will also need to take a photo of the start location and capture the start point GPS coordinates. Details on how on how to complete the paper or electronic form are provided in Annex 0 Completing the AusLM Transect Information form.

| | | | | |
|---|---|---|---|---|
| **Audit date:** | dd / mm/ yy | **Start time:** | | |
| **Site ID:** | | | **Transect #:** | |
| **Site name:** | | | | |
| **START OF TRANSECT DETAILS** | | | | |
| **Starting GPS location:** | Latitude | | Longitude | GPS accuracy: |
| **Optional compass bearing from start to end point (beach/park only):** | | | | |
| | | | | |
| **Transect width is mostly constant?** | ☐ Yes ☐ No | | **Transect start width:** | **Transect length:** |
| **Tran. start photo ID:** | | | | |

Figure 4. Top and START OF TRANSECT DETAILS section of the Transect Information form

[6] Items 2 and 3 above will occur at the same except for beach sites where surveyors walk up one side of the tape to the end point and then walk back to the starting point on the other side of the tape. By the time you finish the litter audit, you will be back at the starting point, not the end point.

**2. At the end point of the transect.**

At the end point of the transect you need to take a photo at the end of the transect looking towards the start of the transect. If this is the first time the site is being audited, then you will also need to take a photo of the end location and capture the end point GPS coordinates. For some site types with a variable width, you will also need to measure and capture the transect width at the end point.

**3. At the end after the transect has been audited**

If using paper AusLM forms to collect transect context data, complete the *END OF TRANSECT RECORDING* section of the AusLM Transect Information form after the transect has been audited. This section of the paper form is presented below in Figure 5. If using electronic AusLM forms in FieldTask or SMAP, then you should continue to complete the Transect Information End form. Details on how on how to complete the paper or electronic form are provided in Annex 0 Completing the AusLM Transect Information form.

| **END OF TRANSECT RECORDING** | | | | | | |
|---|---|---|---|---|---|---|
| Transect includes: | ☐ BBQ area<br>☐ Ditch or drain | ☐ Tables/benches/ seating<br>☐ Garden beds | ☐ Mow line<br>☐ Raised planter boxes | ☐ Fence / temporary fence<br>☐ Public transport stop/transit centre | ☐ Playground<br>☐ Hard rubbish | ☐ Bins |
| | | | | | | |
| **Grass length:** | ☐ Short (0 - 9 cm) | ☐ Medium (10 - 19 cm) | ☐ Long (20+ cm) | ☐ N/A | | |
| | | | | | | |
| **Estimation used:** | ☐ Cigarette butts were estimated | | **Sub-sampling used:** | ☐ All items counted using sub-sampling method | | |
| | | | | | | |
| **Illegal dumping present:** | ☐ No | ☐ Small  | ☐ Medium  | ☐ Large  | | |
| | | | | | | |
| **Transect end width:** | | | | | | |
| **End GPS location:** | Latitude | | Longitude | | GPS Accuracy: | |
| **Tran. end photo ID:** | | | | | | |
| **Transect notes:** | | | | | | |
| **End time:** | | | | | | |
| | | | | | | |
| **BEACH ONLY** | | | | | | |
| **2 m into dunes/rear vegetation surveyed:** | ☐ Yes | ☐ No | **Engineered structure at rear of beach:** | ☐ Yes | ☐ No | |

Figure 5. SITE CONTEXT section of the Transect Information form

## 6.3 Conduct the litter count

This step involves actually counting and categorising the litter you find within transects at the site. For sites audited through the official AusLM monitoring program, **litter is counted, it is not picked up and removed from the site**. Exceptions to this rule include needles and syringes at all sites and broken glass that pose an immediate injury risk at beaches and parks. Groups wishing to pick up litter at sites should read Section 6.5 Picking up litter during the count.

Each valid litter item you find needs to be marked on the AusLM Transect Litter Count form. You will learn more about the form and how to complete it later in Section 0 Recording an item on the Transect Litter Count form.

Before conducting the litter count within a transect area, you will need to understand the AusLM litter item categories and some special rules about specific litter items to help you categorise them consistently and accurately.

### Overview of litter items

During litter counting, you need to be able to identify and categorise numerous different types of litter items.

#### Material types

Litter items recognised by AusLM are categorised by the type of material they are made from.[7] Table 4 lists and describes these material types and provides some guidance on how to identify them.

Table 4. AusLM litter material types.

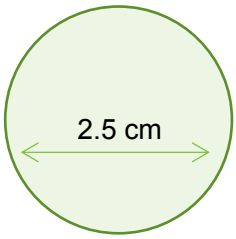
| Material type | Description and key points |
|---|---|
| **Plastic** | Plastics come in many shapes, sizes and types.<br><br>Hard plastics are used to make bottles and other more rigid food packaging. Hard plastic can be clear or coloured and it will usually bend and flex and return to close to its original shape and size when pressed or stood on. Hard plastic bottles are likely to make a dull 'donk' kind of noise when gently hit.<br><br>Soft plastics are commonly used to make bags or food wrappers. Soft plastic is very easy to fold, bend and compress into a small volume when pressed or stood on. It will commonly spring back to some extent afterwards, but it will not return to its same shape and size. |
| **Polystyrene** | Technically a type of plastic, but it is sufficiently different and easy to identify as another material type.<br><br>Polystyrene, sometimes known just as 'foam' is very light, usually but not always white, used in a range of food/beverage containers & goods packaging (small balls, beans & boxes) |

[7] Some items are made from composite materials (e.g. a take-away coffee cup is often made from paper with a plastic lining). AusLM categorises these into a category of the main material component.

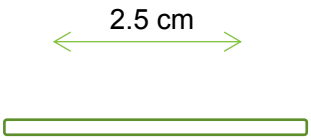
| Material type | Description and key points |
|---|---|
| **Glass** | Commonly used to store food and beverages in jars and bottles. Most glass items you find will likely be classified in the beverage container section or under the fragments section of the data sheet.<br><br>Glass is hard & brittle and usually transparent allowing light to shine through. It does not bend or flex when pressed or stood on. It is more likely to break into small(er) fragments. Glass bottles are likely to make a bright sharp 'ting' kind of noise when gently hit. |
| **Cloth** | Includes textiles, string and clothing. Usually soft and flexible and come in a wide range of colours. |
| **Metal** | Whilst there are many different types of metals, AusLM is focused on those commonly used in items that are littered.<br><br>It is generally strong and malleable (bendable, when used as a thin layer) and not transparent. |
| **Paper and cardboard** | Commonly used for packaging, wrapping, print newspapers & marketing materials (posters/flyers).<br><br>Compared to soft plastic, paper and cardboard make a distinct shearing sound when they are torn.<br><br>Containers made primarily from paper are sometimes known as tetra pak cartons (paperboard with thin plastic and aluminium lining). |
| **Rubber** | Versatile material used for a range of applications in items such as vehicle tyres and rubber bands. Rubber is very springy and will generally spring back to same shape and size. |
| **Other materials** | Includes litter items that do not fit into the above material types. Includes an 'unknown item' litter item category. One common use of the other materials category in AusLM is to list generic non-plastic alternatives to plastic litter items. For example, the plastics section contains a 'Straw' litter item. 'Straw (non-plastic)' is listed as an alternative to this in the 'Other materials' category to capture paper, bamboo and metal straws. |

**Minimum item size**

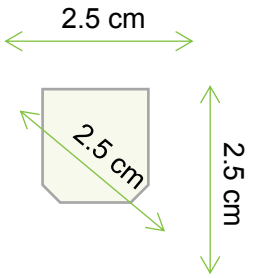
The AusLM targets litter items that are larger than 2.5 cm (along their longest axis). The following set of figures show two examples of items that would be counted in AusLM and one example of an item that is smaller than the minimum size.




This bottle lid is 3 cm in diameter and is therefore included in the AusLM count.




This lollipop stick is 4 cm long and 2 mm wide. The 4 cm long length is greater than 2.5 cm and therefore it is included in AusLM.




This paper fragment is not counted in AusLM as it is only 2 cm long along its longest length.

Most litter items in the general item list are 2.5 cm or greater in size along their longest axis, however, several items smaller than 2.5 cm are counted because they are of particular interest to key stakeholder groups:

- cigarette butts
- bottle tops, lids and caps
- can ring pulls

A minimum item size guide is included in the AusLM kit and this can be worn around your wrist or stuck onto your clipboard to use as a quick reference. You can compare the size of a litter item you find with the minimum item size guide to quickly make a decision if the litter item is greater than 2.5 cm.

**Components of the AusLM Transect Litter Count form**

The AusLM Transect Litter Count form is used to record each valid litter item you find within a transect. Generally, you will only need to complete one Transect Litter Count form for each transect, however, if the transect is heavily littered and you run out of room to mark new items, you may need to complete additional forms. The form is organised into four main sections:

- **Transect Information**
- **Beverage containers**
- **Unidentifiable fragments**
- **General litter items**

Details about each of these sections is documented below along with special rules to follow for partial items and procedures for when there are very high numbers of items that generally make counting litter difficult and time consuming.

## Transect identification details

The top of the first page of the form contains a few fields that you must complete to help identify the site and transect you are auditing. **Recording the site ID and transect number is critical** and all the information you need can be found on the related Transect Information form. Figure 6 shows what needs to be completed.

| | | |
|---|---|---|
| **Survey Date:** | dd / mm/ yy | |
| **Site ID:** | | **Transect #:** |

Figure 6. Top of the Transect Litter Count form

## Beverage containers

Beverage containers such as bottles, cans and cartons are historically a commonly littered item and are the target of jurisdiction-wide interventions such as Container Deposit/Refund Schemes (CDS)[8].

### Container contents and type

There are some specific characteristics about drink containers that you need to identify to correctly classify these litter items:

- Material type (plastic, metal, glass and cardboard) used in the containers
- Contents (type of beverage) of what was (or is) in the container. The product name or ingredients panel on the label can be used to help identify the contents. AusLM groups many of the beverage types together in combined categories. The Transect Litter Count form uses abbreviations of some contents descriptions to save space.
- Container size – discussed in more detail below.

The beverage containers section of the Transect Litter Count form is presented in Figure 7 and documents the different material types and types of beverages grouped together. Examples of common litter items for each combination of material and beverage type are provided in Annex 0.

[8] CDS is also known as a Container Refund Scheme (CRS) such as Containers For Change in Queensland.

### Beverage container sizes

Recording the size of beverage containers during the AusLM count is important. Knowing the size of these containers helps estimate their volume which is needed for reporting. Some items are included or excluded from CDS based on their size. Knowing this size information can help monitor and evaluate the effectiveness of CDS policy.

AusLM grades beverage containers into different size categories based on the volume of liquid that is labelled on the container. The size categories for containers are defined in Table 5. The container or container label will display the volume in millilitres (ml) or litres (l). If the label is not present or illegible, then use your general knowledge and the general guidelines in the size descriptions to assist accurately allocate the container to the correct size.

Table 5. Container sizes

| Size | Description or example |
|---|---|
| < 150 ml | Small containers, often soft plastic drink pouches that hold less than 150 ml (just over half a metric cup). |
| 150 - 499 ml | Smaller plastic or glass bottles, most cans. |
| 500 - 999 ml | Includes most wine bottles, long-neck beer bottles, large flavoured milk cartons and medium soft drink bottles. |
| 1000 - 3000 ml | Large soft drink bottles or plain/white milk containers |
| > 3000 ml | Large containers of water. |

The beverage container section of the Transect Litter Count form is displayed below in Figure 7.

| | | Container sizes | | | | |
|---|---|---|---|---|---|---|
| **Material** | **Contents** | **<150 ml** | **150-499 ml** | **500-999 ml** | **1000-3000 ml** | **>3000 ml** |
| **PLASTIC** | Drink pouches | | | | | |
| | Flav. Milk | | | | | |
| | Soft Dr/FW/FJD/SpD/EnD | | | | | |
| | Fruit/vegetable juice | | | | | |
| | Water | | | | | |
| | White milk | | | | | |
| **GLASS** | Wine | | | | | |
| | Spirit | | | | | |
| | Premixed spirit drinks | | | | | |
| | Beer | | | | | |
| | Cider | | | | | |
| | Soft Dr/FW/FJD/SpD/EnD | | | | | |
| | Fruit juice | | | | | |
| | Water | | | | | |
| | Wine-based/wine cooler | | | | | |
| **METAL** | Alcoholic mixers | | | | | |
| | Beer | | | | | |
| | Cider/fruit based | | | | | |
| | Soft Dr/FW/FJD/SpD/EnD | | | | | |
| | Wine Bladders | | | | | |
| **CARD*** | Flav. milk (Cartons) | | | | | |
| | Fruit Juice | | | | | |
| | FW/FW/FJD/SpD/EnD | | | | | |
| | Milk, plain (white) | | | | | |
| **Any** | Other beverage | | | | | |

Figure 7. Beverage container section of Transect Litter Count form

* Containers made primarily from paper are sometimes known as tetra pak cartons (paperboard with thin plastic and aluminium lining. These are grouped into the CARD(board) category.

**Legend for contents abbreviations**

| | |
|---|---|
| FW | Flavoured Water |
| FJD | Fruit Juice Drink |
| SpD | Sport Drinks (including energy drinks) |
| EnD | Energy Drinks |

## Unidentifiable Fragments

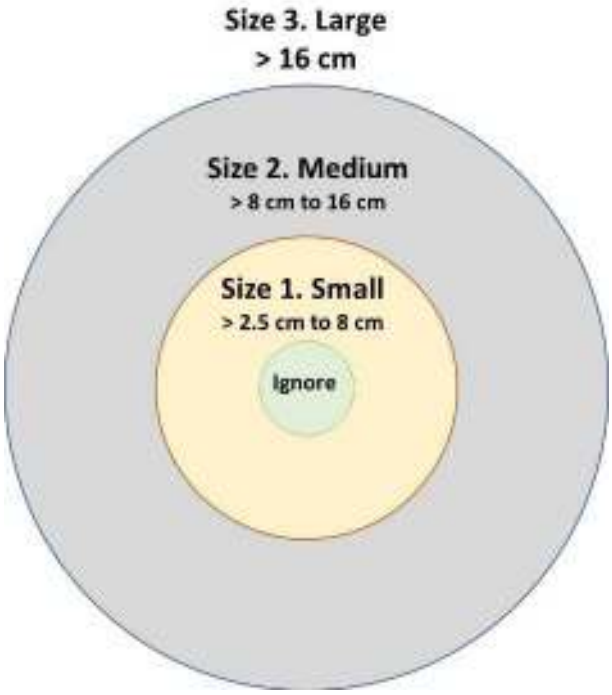
Items are categorised as unidentifiable fragments when a piece of litter is either no longer identifiable as a whole item, or there is less than half of the whole item found in one or multiple contributing pieces. The next section provides clear rules for when items are to be categorised as whole items or unidentifiable fragments.

Fragments are grouped by material category and size. The material categories for fragments are:

- hard plastic
- soft plastic
- polystyrene
- glass
- paper and cardboard
- metal
- cloth
- rubber

There are three size categories for fragments:

1. Small > 2.5 cm to ≤ 8 cm
2. Medium > 8 cm to ≤ 16 cm
3. Large – Anything bigger than 16 cm




Fragments smaller than 2.5 cm will not be counted.

Items are measured along their longest axis. Put simply, If the item extends beyond the green circle and fits within the yellow circle documented in the Fragment Size Guide, then it is categorised as a small fragment. If one edge or length of the litter item extends past the small yellow circle, but does not extend past the grey circle, then it is classified as a medium-sized fragment. Any item that does not fit within the grey circle is classified as a large fragment.

A Fragment Size Guide (Annex 0) will help you categorise litter fragments into the correct size. A copy of the Fragment Size Guide should be kept in your clipboard for quick referencing whilst counting litter. Figure 8 contains the Unidentified Fragments section of the Transect Litter Count form.

| | Material type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Fragment Size** | **Hard Plast** | **Soft Plast** | **Polystyrene** | **Glass** | **Paper & card** | **Metal** | **Cloth** | **Rubber** |
| **Size 1 – Small (> 2.5 cm to 8 cm)** | | | | | | | | |
| **Size 2 – Medium (> 8 cm to 16 cm)** | | | | | | | | |
| **Size 3 – Large (> 16 cm)** | | | | | | | | |

Figure 8. Unidentified fragments section of Transect Litter Count form.

## Special rules for partial litter items or one litter item broken into multiple pieces

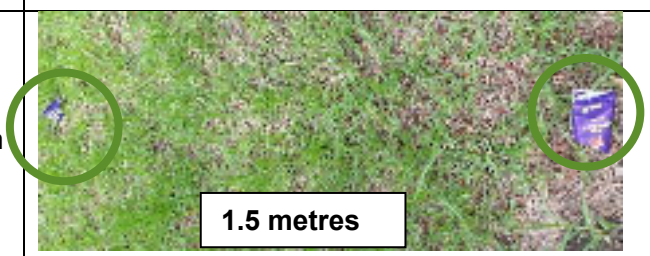
When counting litter, it is common to find only one part of a littered item, or one item broken into multiple pieces within a small area of the transect. For example, you may find a confectionary wrapper that is missing the top section, or you might find an aluminium can that has been broken into three or more different parts spread across a small area of the transect.

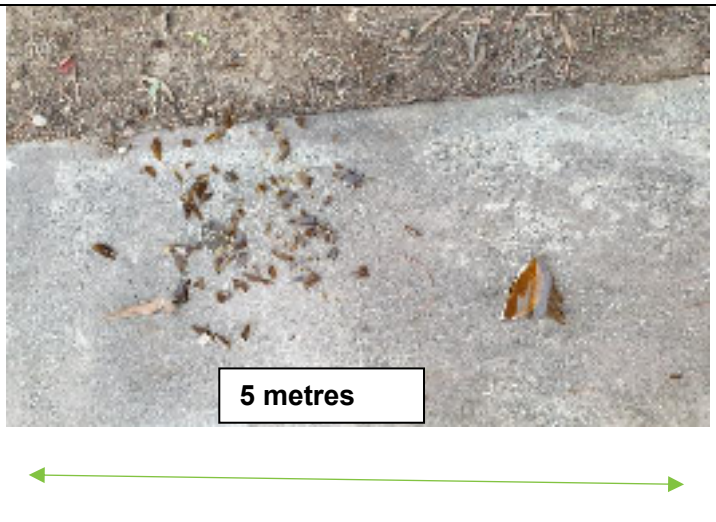
You should follow these rules to consistently and accurately categorise litter items in these scenarios:

- If half or more of a litter item is found and you can identify the item, then treat it as a whole item.
- If you find several parts of the same litter item (judged based on material/colour/size/brand etc.) within approximately 1 square metre, that if joined together would represent half or more of the litter item and you can identify the item, then treat it as a whole item.
- For pieces of a container to be classified as whole items, one or more pieces of the container must have a label attached.
- If less than half of the litter item is found in one section or multiple pieces, **or** you are not able to identify what the item is by looking at the fragments, or you are unsure if the above criteria are met, then classify the item as Unidentified Fragments.

Some common examples to explore how to categorise broken litter items are presented in Table 6.

Table 6. Litter item fragment scenarios

| Scenario | Sample image | Decision |
|---|---|---|
| You find half (or more) of a chocolate bar wrapper |  | Count as one confectionary wrapper |
| You find 3 small pieces of what appears to be the same chocolate bar wrapper within 1 square metre of the first piece of wrapper. |  | Count as one confectionary wrapper |
| You find half of a chocolate bar wrapper and then you find another smaller portion of a chocolate bar wrapper of the **different brand** within one metre of the first wrapper section. |  | Count one confectionary wrapper and one soft plastic fragment (Size 1). |
| You find half of a chocolate bar wrapper and then you find another smaller portion of a chocolate bar wrapper of the **same brand a few metres** |  | Count one confectionary wrapper and one soft plastic fragment (Size 1). |

| Scenario | Sample image | Decision |
|---|---|---|
| **further down the transect**. | | |
| You find three pieces of a plastic bottle (or can or carton) that are next to each other (within 1 sq. m) and it is highly likely originate from the same littered item and if reassembled would form half of more of the original item. |  | Count one plastic bottle in the beverage containers section. |
| You find multiple adjacent pieces of glass within 1 sq. m with a label that if reassembled would resemble a glass bottle. |  | Count as one whole glass bottle in the beverage containers section. |
| You find multiple pieces of glass with that if reassembled would likely resemble a glass bottle, but the glass fragments are spread across 5 m of the transect and there is no obvious label. |  | Count each piece of glass (>2.5 cm) as a separate fragment. |

## General litter items

General litter items are recognisable items that are commonly littered. These items are categorised by material type and sorted by alphabetical order within each material type. Some items such as plastic bags and lids are broken down into a detailed sub-set of item types. This helps understand the impact of policies and interventions that targeted these specific items. The back page of the Transect Litter Count form contains the general litter items and this is reproduced in Figure 9 (See next page). A list of the items found in the general litter items list along with their descriptions and images of difficult to identify items are included in Annex 8.2. This list can help you learn what kinds of litter objects should be classified under which litter item category.

Additional advice and rules to help you categorise litter in the general items section are shared below.

**The 'Other' category for each material type.**

Each material type includes an 'Other' litter item category. If you find an item and you can identify the material type, but you **can't** find on the litter count form, then it should be classified under the 'Other' category for the specific material type. For example, if you find a BBQ gas cylinder, then this would be categorised as 'Other metal' under the Metal category.

**The 'Unknown item' category.**

If you can't identify what a litter item is or where it should be classified, then include it in the 'Unknown item' category of the 'Other items'. You can also make a note in the Transect Information form of any difficult or unknown items. This might help improve training and instructions to better categorise the item in the future.

## Litter item exclusions

AusLM does not recognise or count the following litter items as part of its standard method:

- Leaves & branches, bark, other vegetation
- Chewing gum
- Items in or on the fringes (within 1 metre) of commemorative sites
- Items in or on the fringes (within 1 metre) of piles of illegal dumping and hard rubbish
- Items smaller than 2.5 cm

| | Item | Count | | Item | Count |
|---|---|---|---|---|---|
| PLASTIC | Bag - Dog Poo | | OTHER MATERIALS | Balloons | |
| | Bag - Fruit/Veg | | | Batteries | |
| | Bag - Green Reusable | | | Condom | |
| | Bag - Heavy Boutique | | | Construction materials | |
| | Bag - Heavy Supermrkt | | | Cotton buds/tips (non-plastic) | |
| | Bag – Ice | | | Cutlery (non-plastic) | |
| | Bag -Lightweight shop - blue | | | Dog poo | |
| | Bag -Lightweight shop - grey | | | Electrical wire | |
| | Bag -Lightweight shop - white | | | Face mask – disposable | |
| | Bag -Lightw. shop other colour | | | Face mask – reusable | |
| | Bag - Mesh Bags | | | Fruit/vegetable/food | |
| | Bag - Other | | | Ice Cream Stick | |
| | Bread bag tags/twist ties | | | Nappy | |
| | Cable ties | | | Personal Effects | |
| | Cigarette Lighters | | | Plate/bowl (non-plastic) | |
| | Cigarette packet cellophane wrap | | | Rope/string | |
| | Cotton buds/tips | | | Sanitary Items | |
| | Cup – Singe use | | | Stirrers (non-plastic) | |
| | Cup – Reusable | | | Straw (non-plastic) | |
| | Cutlery/chopsticks | | | Vape pen | |
| | Fishing related | | | Vehicle parts | |
| | Food/confect. Wrappers | | | Wet wipes | |
| | Lids - Beverage container lids /caps | | | Wooden item | |
| | Lids - Plastic cup lid | | | **Unknown item** | |
| | Lids -Coffee cup lid | | | | |
| | Lids – Plastic (other) | | PAPER & CARD | Bread bag tag | |
| | Lollipop Sticks | | | Cigarette packets | |
| | Non-Food Bottle | | | Cup - Coffee cup | |
| | Non-Food package | | | Cup - Other paper cup | |
| | Other Food Package | | | Ice cream wrappers | |
| | Plate/bowl – single use | | | Junk mail / free circulars | |
| | Plate/bowl – reusable | | | Newspaper/Magazine | |
| | Plastic wrap non-food | | | Packages & boxes | |
| | Six pack rings | | | Paper bags | |
| | Strapping band | | | Paper tissues/napkin | |
| | Stirrers | | | Shopper dockets, tickets/receipts | |
| | Straws | | | Takeaway containers | |
| | Syringe | | | Vape packaging | |
| | Takeaway food container | | | **Other paper & card.** | |
| | Tape/narrow soft plastic film | | RUBBER | Rubber band/hair tie | |
| | Tobacco pouch | | | Rubber toy | |
| | Toys | | | Tyre pieces | |
| | Vape packaging | | | Tyres | |
| | Whipper-snipper cord | | | **Other rubber item** | |
| | **Other plastic item** | | | | |
| METAL | Aerosol cans | | POLY | Cups (foam) | |
| | Aluminium foil wrap | | | Food pack./clam shells | |
| | Foil takeaway container | | | Insulation & Packaging | |
| | Lids, bottle tops, can ring pulls | | | **Other polystyrene item** | |
| | **Other metal item** | | | | |
| GLASS | Glass jars | | CLOTH | Clothing | |
| | **Other glass item** | | | **Other cloth item** | |
| | | | | | |
| | | | | | |
| | | | | | |

Figure 9. General items section of Transect Litter Count form.

## Estimation - High numbers of litter items

Counting large numbers of litter items (e.g. cigarette butts) is time consuming. An estimation technique can be used in situations where an initial inspection of a transect identifies there are very high numbers of cigarette butts or whole items. One of two methods can be used to estimate the amount of litter:

1. Visual estimation of cigarette butts – Used when there are highly littered areas of cigarette butts within the transect.
2. Sub-sampling – Used when there are very high numbers of littered items spread out across the entire transect.

### 1. Visual estimation of cigarette butts

Visual estimation is a fast way to count large numbers of cigarette butts when there is a large area with a similar density of littered butts. In this instance, a large area is defined as an area greater than 20 cm x 20 cm. For areas smaller than this is will just as quick to count all the butts in a normal manner with assistance from a clicker/tally counter.

Follow the steps below to estimate the number of butts in a large area.

1. Hold your mobile phone over the top of one of one of the areas where there is a high density of cigarette butts.
2. Insert four tent pegs, or use chalk sticks to mark hard surfaces, to mark the four corners of the mobile-phone shape.
3. Take your phone away and count the number of cigarette butts within the approximate sized area of your mobile phone, using the tent pegs or chalk marks as a guide. A tally counter can be used to help count large numbers of butts. When counting, work in a logical search pattern starting at the top left-hand corner and work your way across the top until you reach the right-hand side. Then move down and work your way from the right-hand side of the phone shape area to the left. Repeat this pattern until all cigarette butts within the approximate mobile phone shaped area are counted.
4. Write the number of butts counted in the *ESTIMATION* section of the Transect Litter Count form.
5. Count how many neighbouring areas within the transect have a similar density of cigarette butts to that just counted. Add one to this number to provide a total number of areas with this density of cigarette butts.
6. Write the number of areas in the *ESTIMATION* section of the Transect Litter Count Form.
7. Continue to count cigarette butts throughout the remainder of the transect in the normal manner.
8. Mark the ‘Cigarette butts were estimated’ checkbox on the Transect Information form.

Figure 10 shows a simple example of how estimation works within a transect. The data entered into the Litter Count Form for the example is also provided. Cigarette butts outside of the four mobile-phone-sized areas will be counted in the normal manner.

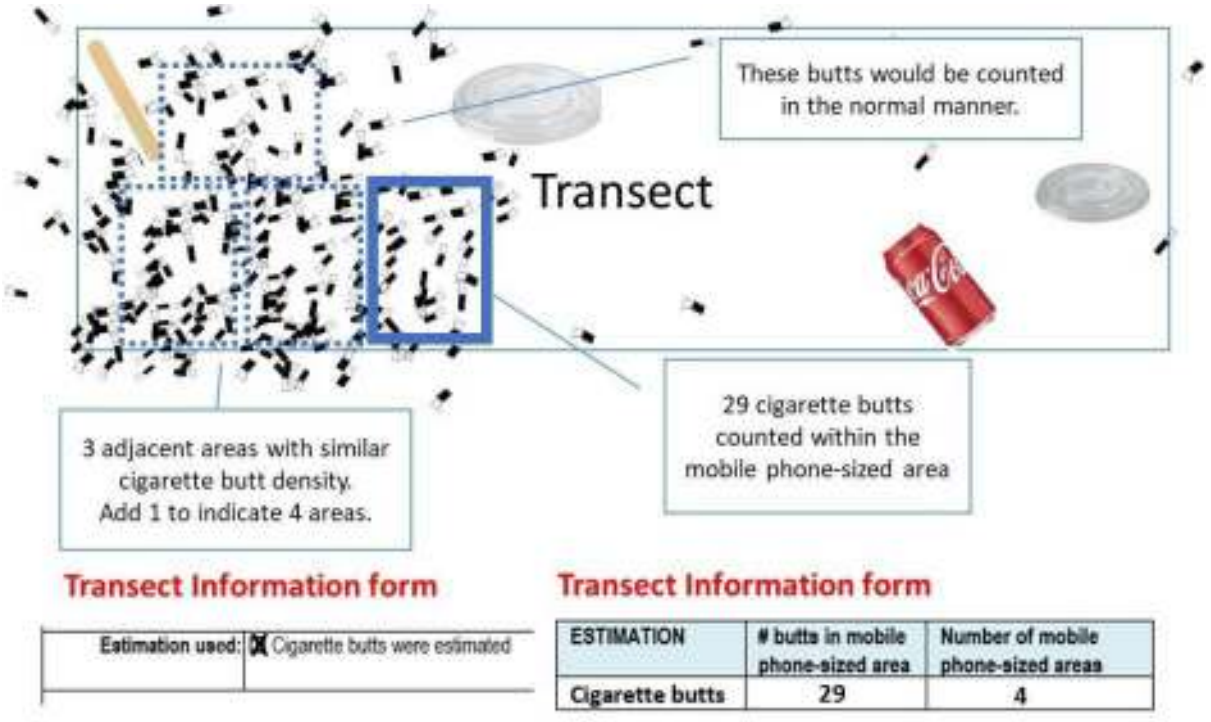



Figure 10. Cigarette butt estimation example with sections of Transect Information and Transect Litter Count form completed.

**2. Sub-sampling – Used when there is high density litter across the entire transect**

Sub-sampling is another technique that can be used to estimate the amount of the litter present within a transect. Sub-sampling is only to be used in exceptional circumstances where a visual inspection of the transect to be surveyed reveals there are more than 5 litter items (fragments, cigarette butts or whole items greater than 2.5cm in size) per square metre across most of the transect area. If there are less than 5 items per square metre, or only a small portion of the transect is heavily littered, then it is required that all litter items within the transect are counted.

AusLM's approach to sub-sampling involves surveyors counting litter in 1 square metre quadrats (square within the transect) placed every 3-metres along the length of the transect. The quadrats should be alternated on the left and right-hand side of the transect centre line. A step-by step description of the process is provided below, and an example is shown in Figure 11.

*How to estimate litter using sub-sampling.*

1. Assemble the 1 m x 1 m sub-sampling frame (or equivalent).
2. Go to the start of the transect.
3. Place the sub-sampling frame to the left of the transect line at the starting point.
4. Count litter in this 1 square metre area.
5. From the end of the sub-sampling frame, measure 2 m forward towards the end of the transect.
6. Lay down the sub-sampling frame to the right of the transect centre line.
7. Count litter in this 1 square metre area.
8. From the end of the sub-sampling frame, measure 2 m forward towards the end of the transect.

9. Repeat steps 3 to 8 until the end of the transect is reached and remember to keep a tally of the number of quadrats (1 m x 1 m areas) counted.
10. Mark the checkbox on the Transect Information form to indicate sub-sampling was used and then enter the number of quadrats (sub-samples) audited.

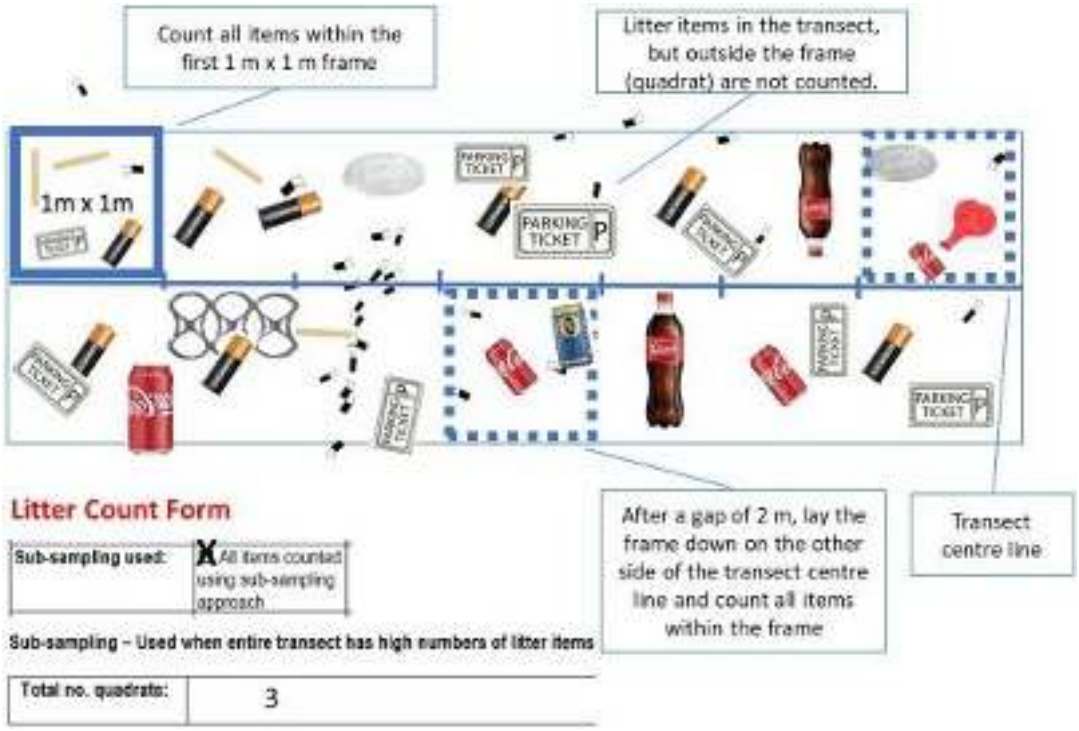



Figure 11. Sub-sampling example

It would be invalid to visually estimate cigarette butts within a sub-sample quadrat. If a high-density pile of butts is found within a quadrat then the butts should be individually counted.

## General rules for litter counting

The AusLM has a standardised process for **how to count litter.** Follow these general rules:

1. Walk in an upright position looking forward. Do not bend down to see litter items that would otherwise not be visible from a standing height.
2. Walk at a constant speed. Refer back to your training and the guidance given around what speed to walk.
3. Where possible and safe to do so, walk away from the sun so you are not looking into your shadow.
4. Every time you observe an item of litter that is greater than 2.5 cm in size[9], identify what litter item category it belongs to and add a tally next to the item on the Transect Litter Count form.
5. Use your litter poking stick to help view items that are partially covered by grass or vegetation, or to roll/flip items over for a better view.

[9] or cigarette butts, bottle lids, bottle caps or can ring pulls

6. If you are unsure how to classify the item, you can bend down and look closer at the material type and any labels or distinguishing features that are present. You should only pick up an item to inspect it if you are wearing protective gloves. After you have correctly identified the item, add it to your tally, stand up and continue walking in an upright position.
7. Use the AusLM Fragment Size Guide in your clipboard to help correctly identify the size of unidentified fragments.
8. Be careful not to miss items and not to double count items.
9. Do not be tempted to count items that are outside the transect boundary. Counting litter is not a competition to get the highest score.
10. If a litter item crosses over the edge of the transect boundary, then it can be counted.
11. If your transect has a centre line (e.g at a beach, park or main road site), and an item of litter crosses over the centre line, then count the litter item on your first pass down the transect and ignore any litter items that cross the centre line on your return pass up the other side. This will help avoid double counting.
12. If you are unsure about a specific litter item or scenario, then you can take a photo and make some notes on the Transect Information form to prompt a discussion with the supervisor at a later time.

**How fast should you walk when surveying?**

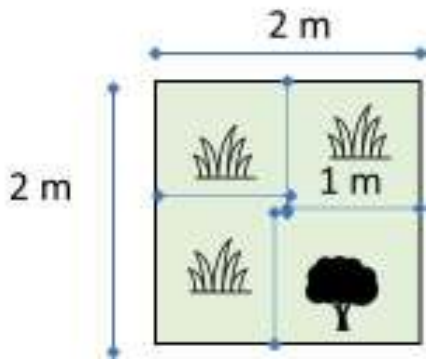
Every day you should undertake one timed simulated litter audit walk to refamiliarize yourself with the speed that you should be walking when undertaking litter audits. If you walk faster than recommended, you may miss items that another surveyor would find who is walking at the correct speed. If you are walking too slowly, you will not be efficient and may identify more (particularly small) objects than someone walking at the correct speed.

Use your measuring wheel and mark out a distance of 20 m in a safe outdoors space. Think back to your AusLM training and time your walk of the 20 m distance. **The recommended time to walk 20 m is between 30 seconds and 60 seconds.** If the site surface is clear (paved or low-cut grass), then a speed of 20 m per 30 seconds is appropriate. You may need to walk slower at a speed of 20 m per 60 seconds if auditing litter in dense grass or tall grass environments. If your recorded time is outside of this range, then adjust your speed as required and repeat the process.

## Additional litter counting rules

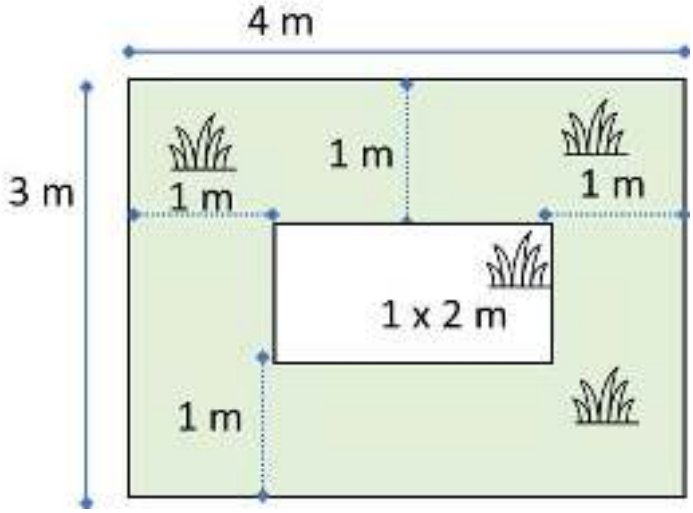
**Look for litter on the ground and up to 2 m above the ground.** You should count litter items observed on the ground and in trees, bushes or other raised structures (e.g. fences) up to 2 m above ground level. Litter items observed above 2 m high should be ignored. Only litter that is observable from standing height should be counted.

**Bushes, gardens, garden beds and planter boxes.** If these features are found within the transect, then litter found up to one metre in from the edges of these features should be counted. You should not walk in these areas to avoid damaging plants and exposing yourself to unnecessary risk. You can use the 1 m mark on your litter poking stick to carefully help inspect these areas for litter up to one metre in from each edge. If these features within the transect are greater than 2 m wide or not able to be accurately audited for any reason, then you should estimate any area not audited and note it on the first page of the Transect Litter Count form. Figure 12 & 13 below illustrate examples of auditing garden beds.




All areas of the 2 m x 2 m garden bed can be audited by reaching in 1 m from each side.

Figure 12. 2 x 2 m garden bed




After reaching in 1 m from each side, the internal clear (white) 1 m x 2 m section of the garden bed is left unaudited. This area would be added to the 'area not audited' section of the Transect Litter Count form.

Figure 13. 4 x 3 m garden bed

**Seated eating areas, barbeques, tables and benches, bus stops and bus shelters.** Litter found within these areas within the transect should be counted provided it is safe to do so and you are not encroaching on an individual's personal space. For example, if people are seated at café tables in the street or a park bench, then you should not survey the area under their tables/seats. You should estimate any area not audited and note it on the first page of the Transect Litter Count form.

**Advertising signage and outdoor retail displays.** Areas under or around these features can be surveyed if it is safe and the areas underneath are visible from a standing position. You should not crouch down to look under signage (A-frame signs) or retail displays. For example, it would normally be possible to view litter under a trestle table on the footpath, but it may not always be possible view litter under a clothes rack where the clothes may be hiding litter on the ground. You should estimate any area not audited and note it on the first page of the Transect Litter Count form.

**Parked vehicles on the natures trip or other areas within transect.** Areas under parked vehicles should not be counted. These areas should be estimated and noted on the first page of the Transect Litter Count form.

**Vehicles that cover the gutter.** If there is a vehicle front or reverse parked that covers the gutter in a transect areas, then you should estimate the area covered that can't be audited and include it in the 'Areas not audited' section on first page of the Transect Litter Count form.

**Litter on the transect line edge is included.** In situations where an item of litter touches or crosses the edge of a transect, then it should be counted. In situations where you are making multiple passes of a transect and the litter is on or crosses a centre line, then, count the litter during the first pass of the transect and ignore items that cross the centreline on the second pass.

**Commemorative sites.** Commemorative sites are often found along the side of a road or street. They are usually marked by a bouquet of flowers, reefs or signs. Litter related to commemorative sites should not be counted within 1 metre of the commemorative site. Estimate the area not audited and include it in the 'Areas not audited' section on first page of the Transect Litter Count form.

**Hard rubbish.** Hard rubbish is often found on residential nature strips. The items in hard rubbish piles should not be counted and nor should items within 1 metre of the hard rubbish pile. Estimate the area not audited and include it in the 'Areas not audited' section on first page of the Transect Litter Count form.

**Illegal dumping.** Piles of illegal dumping (including abandoned shopping trolleys) are not counted and nor should items within 1 metre of the illegal dumping pile. Illegal dumping found at sites or within transects should be marked by selecting the appropriate 'Illegal dumping present' box on the Site Information or Transection Information forms.

**When one litter item contains multiple sub-items.** You may find one litter item that contains or is attached to multiple other litter items. For example, you may find a:

- take-away coffee cup with a lid
- cigarette carton with plastic wrap
- cardboard cup with a lid and straw
- A plastic bag no larger than a standard single-use shopping bag contains other items and the other items can be identified

In these instances, you should count each recognisable item (cup, lid, carton, wrap, straw) as separate items. Figure 14 below contains a paper cup, plastic cup lid and straw (non-plastic).

Figure 14. Take-away drink cup with lid and straw

For the situation involving a plastic or paper carry bag containing other items, you would count the bag (plastic bag, paper bag) as one item and ignore the other items in the bag unless they are spilling out of the bag. If other litter items are spilling out of the bag you can easily identify them, then you should record them as individual items.

**Large bag of rubbish.** If you find a large bag of rubbish or other items (a bag much larger than a single-use shopping bag), then this should be treated as illegal dumping with the appropriate 'Illegal dumping present' box being selected on the Site or Transect Information form.

**Personal Effects.** These items include wallets, handbag, watches, jewellery, and mobile phone. There is a litter item category for 'personal effects'. If safe to do so, wear gloves, pick up the item and place it in a bag and hand it in to the nearest police station at your earliest convenience.

## Recording an item on the Transect Litter Count form

There are two methods for recording the litter items you find on the Transect Litter Count form: tally counting and numeric counting.

### Tally counting

Every time you find an item greater than 2.5cm in size, you record it on the sheet by placing a marking the count column with a vertical line. If you have four vertical lines and you find another item of that type, then you put a horizontal line across all four vertical lines to represent a group of five items. You then start a new group if more items are found.

| Litter item | Count | Description |
|---|---|---|
| Cigarette Butts | I I | Two cigarette butts were found |
| Cigarette Lighters | ~~IIII~~ I | Six cigarette lighters were found |

### Numeric counting

If you find many items of the same type in succession or a small area, then you may choose to count the number of items and write down the actual number counted. You must circle these numbers to avoid confusion between tally counting and numeric counting (e.g. II versus 11).

| Litter item | Count | Description |
|---|---|---|
| Cigarette Butts | ~~IIII~~ (23) I I | Six cigarette butts were found. A group of 23 butts were found. Later an additional two butts were found. Total of 31 cigarette buts found. |
| Cigarette Lighters | (10) I | Eleven cigarette lighters were found |

Both techniques can be used on the same Transect Litter Count form.

It is recommended that a dark grey lead pencil be used to complete the Transect Litter Count form. This will make it easier to correct errors and the lead does not run when wet.

## 6.4 Site type specific transect layouts and litter count details

Transect numbers, layouts, length and width vary across the six AusLM site types. The sections below document the characteristics of transects for each site type and provide additional detail on how to conduct a litter count of the transects. A summary of this information is captured in section 6.1 and a similar graphical summary also exists as a separate document titled 'AusLM Transect layout summary - One pager'.

### Residential, retail and industrial sites

**Transect layout and the surveying process for residential, retail and industrial sites are very similar**, however, there are some key differences as outlined in Table 7 below.

Table 7. Street site characteristics

| | Residential | Retail | Industrial |
|---|---|---|---|
| **Number of transects** | 6 | 3 | 3 |
| **Transect layout** | Transect pairs (1 & 2, 3 & 4, 5 & 6) are on opposite sides of the same street. | Transects are not paired. They may be on one or both sides of a street. | |
| | Transect may go round a street corner | | |
| **Transect length** | 100 m | 100 m | 100 m |
| **Transect width** | Household property boundary (may be a fence, or may be identified by household mail boxes)to the outer gutter edge in the street. * <br><br> If there is no clear property boundary, or if the boundary is not uniform, resample and select another transect. | Retail property boundary (shopfront) to the outer gutter edge in the street. * | Industrial property boundary (may be a fence) to the outer gutter edge in the street. * <br><br> If there is no clear property boundary, or if the boundary is not uniform, resample and select another transect. |

* If the far-side edge of the gutter is not clearly defined or visible, then measure and include 50 cm from the edge of the footpath out into the street.

Examples of residential, retail and industrial transect layouts are shown in images between Figure 15 to Figure 16 and Figure 18 to Figure 21 on the next page. Figure 17 shows an example of a residential transect without a clear boundary or a non-uniform shape. In this situation you would resample and find another transect to audit. This scenario or resampling should also occur if you find an industrial site without a clear property boundary or a non-uniform shape.

Be particularly careful at these sites with road hazards, especially when crossing the road.

# Residential


Figure 15. Example of how six transects (orange lines) could be laid out at a residential AusLM site.

Figure 16. Width of residential transect, shown by blue line. The property boundary is shown with a red line and runs along fence line and mailboxes also used to help define the boundary. The transect extends from the edge of the property to the edge of the gutter in the road.

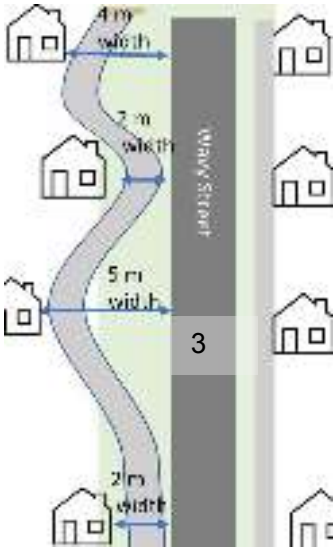



Figure 17. Residential transect with no clear boundary / non-uniform shape. In this instance you should resample and find another transect to audit.

# Retail


Figure 18. Example of how three transects (orange lines) could be laid out at a retail AusLM site.


Figure 19. Width of retail transect, shown by blue line. Note it extends from the retail property boundary to the outside edge of the gutter in the road.

# Industrial


Figure 20. Example of how three transects (orange lines) could be laid out at an industrial AusLM site.

Figure 21. Width of industrial transect, shown by blue line. Note it extends to the property fence line.

**Detailed process for counting litter at residential, retail and industrial sites:**

1. Walk to the start of the transect. See Finding the transect start and end points in Section 0.
2. Fill out the relevant information on the Transect Information form as per Section 6.2.
3. Start walking along the transect, counting litter. You will walk in a meandering S-shape search pattern (Figure 22). This involves winding your way back and forth along the transect to ensure that you walk within at least 1.5 m of all areas on the transect. You will need to walk close to the street in order to inspect the gutters.

   *For transects where the width is 3 m or less, you can walk in a straight line down the middle of your fixed 3 m wide transect.* If you are unable to view litter in the gutter, then walk back along the edge of the gutter to count this litter.

4. Continue along the transect to the end point, which should be identifiable by GPS coordinates and a description and potentially a photo. Note that the transect may go round a corner. This will be marked on the satellite map image.

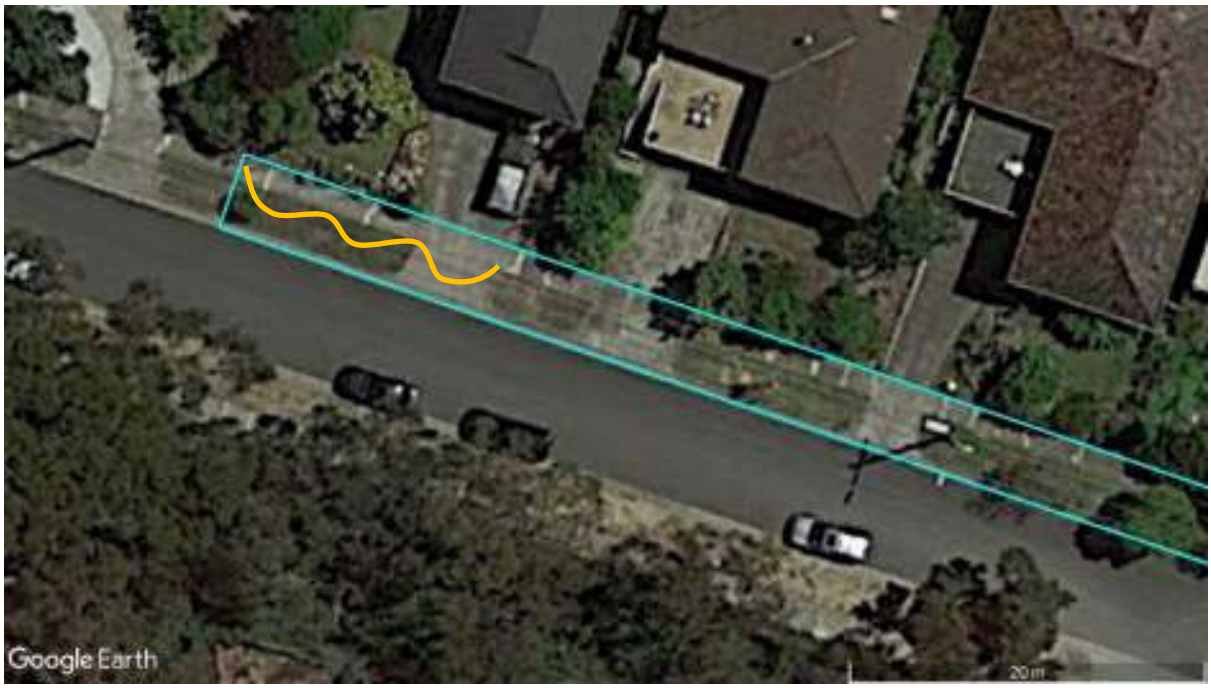



Figure 22. Example of S-shaped search pattern for surveying litter on residential transect >3 m wide.

**Key points to remember are:**

- Litter in the gutter is counted. The gutter is demarked either by the concrete gutter itself, or 50 cm from the edge of the footpath if the structure of the gutter is not clear.
- Litter on the edge of a stormwater drain entry points is included, but litter inside drains is not.
- When counting litter along residential, industrial and retail transects, use the dominant retail shopfront or property boundary/ fence line as your guide. There may be cases where there are shopfront entrances that present an opportunity to count a wider width.

There may be cases were fence lines have some inset areas that expand the width of the transect. In these cases, do not include these additional areas within the transect.

## Recreational parks

**Recreational parks sites have five transects**. Surveyors walk along these transects, counting litter as they go. Transects:

- are typically evenly spaced across the park
- have varying lengths, depending on the shape of the park and the start/end transect points provided to you
- are 3 m wide. Surveyors walk in a straight line and count litter 1.5 m either side of where they are walking (Figure 23).

Examples of recreational park transect layout are shown in Figure 24 and Figure 24.

Be aware at recreational sites of the potential for steep or slippery terrain, trip hazards and snakes.

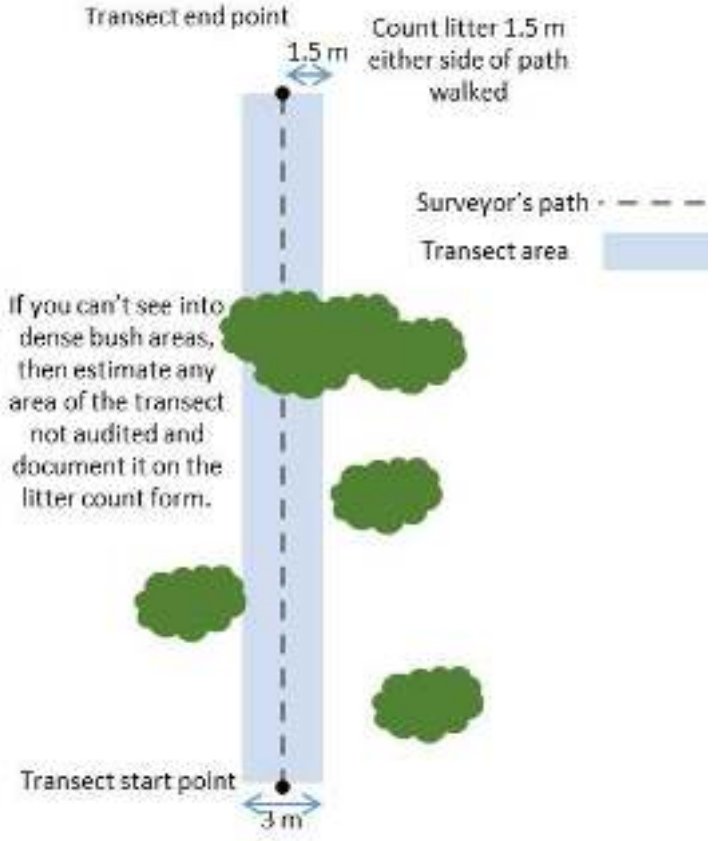



Figure 23. Approach to surveying transect in recreational park.

Figure 24. Example of a recreational park site showing the site boundaries (blue lines) and five transects (orange line). Note that the top four transects have been shifted up to avoid the playground but remain evenly spaced in this part of the site. Red shading indicates areas that would be excluded from transects (play equipment and dense vegetation).

**Detailed process for counting litter at recreational parks:**

1. Mark the start and end point of the transect with flagging tape or a stake with flag. See Finding the transect start and end points in Section 0.
2. Walk to the start of the transect.
3. Fill out the relevant information on the Transect Information form as per Section 6.2. You do not need to record the transect length. This can be obtained from GPS points and satellite maps and/or confirmed with a measuring wheel.
4. Start walking along the transect centreline, counting litter. These transects do not have to be marked but you will need to be careful to walk in a straight line from the start to the end of the transect. If you can't see the end point from the start point, then place another flag mid-way between the two points or on either side of any obstruction. Guidance for navigating in a straight line:
    a. Sight the end point (or mid-point) of the transect or locate the end point using GPS or a compass bearing.
    b. Identify a distinctive point 10-15 m away but in line with the end-point. This might be a bush, tuft of grass, piece of play equipment or section of pathway, etc.
    c. Walk towards this bearing a few paces whilst searching for litter 1.5 m to your left and right. Use your 1.5 m litter poking stick or tape measure to double check litter counted is no further than 1.5 m to your side.
    d. Continue to walk towards your intermediate marker again whilst looking for litter.
    e. Once you reach your mark, repeat the process along the transect bearing until you reach the marked transect end point.

f. If you need to step out to one side to inspect an item of litter, try to keep one foot on the centreline so you can easily return to the centreline and continue walking forward.

**Key points to remember are:**

- **Litter in playgrounds is not counted.** Avoiding playgrounds minimises your proximity to and interaction with children. The safety and perceived safety of children is important.
- Do not search for litter too far ahead of you because it is important to stay on a straight line and to not count litter any further than 1.5 m from the centreline of the transect.
- While transects are laid out based on the site GPS points, they can be moved slightly to avoid running over people and their possessions if there are many people lying down on the grass. If there are only people sitting in one or two places, then you can avoid these areas and estimate the area of the transect not audited and document this on the Transect Litter Count form.
- It may be efficient to identify and mark (flagging tape/stake with flag) the start and end points of all the transects before auditing the site.

## Beaches

**Beaches sites have five transects**. Surveyors walk along these transects, counting litter as they go. Transects:

- are evenly spaced every 25 m across a 100 m section of beach.
- run perpendicular to the slope of the beach – i.e. they run from high up on the shore down to the water. A compass bearing can be used to set the exact direction of the transect.
- have varying lengths, depending on the shape of the beach and the level of the water on the day of the survey.
- are laid out using a tape measure to measure their length but also to provide a guide for walking straight.
- are 6 m wide - surveyors walk 1.5 m out to the side of the tape measure and count litter 1.5 m either side of where they are walking (Figure 25). This is repeated on the other side of the tape measure.

Examples of beach transect layout are shown in Figure 26.

Be aware at beach sites of the potential for steep or slippery terrain (particularly at access points), high waves and stinging animals that may have washed up on the shore (e.g. bluebottle jellyfish).

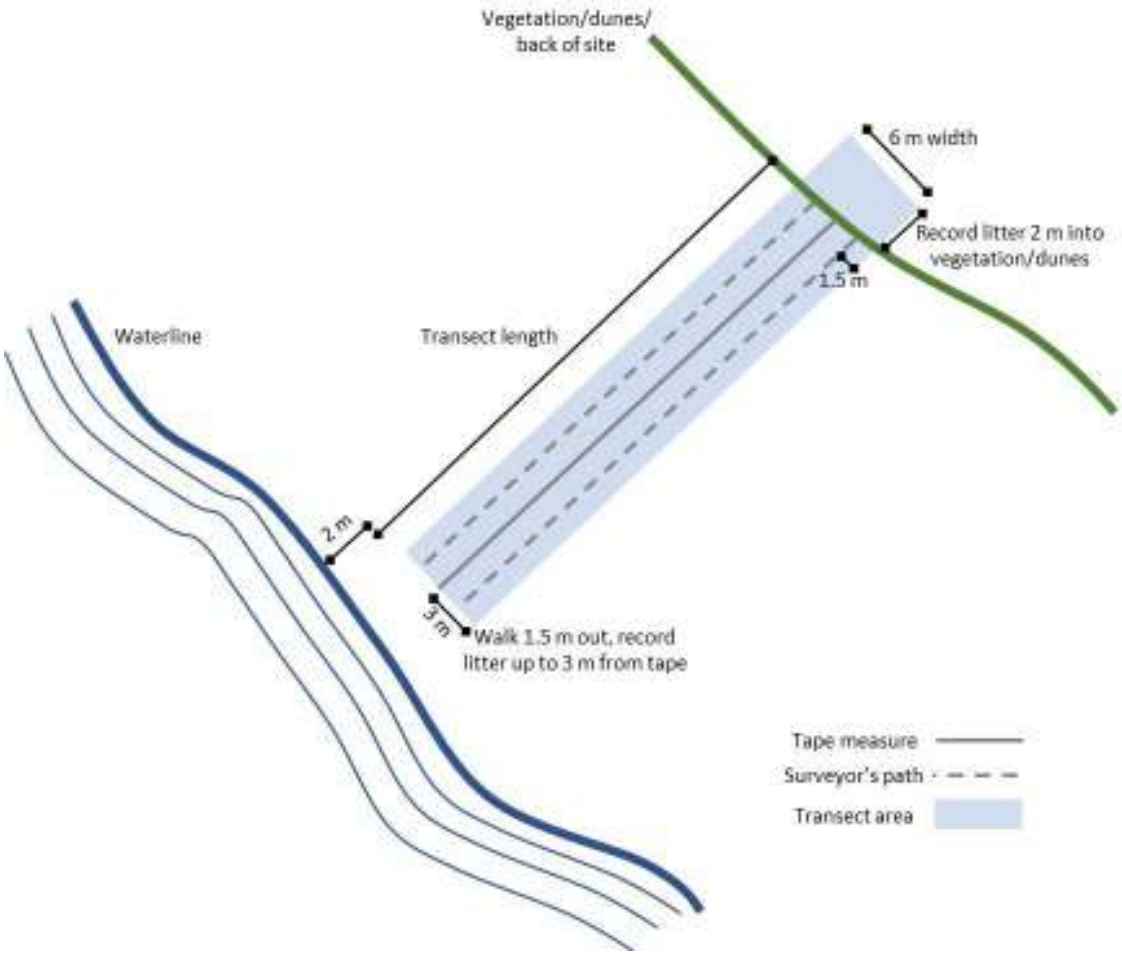



Figure 25. Approach to surveying transect at a beach site.

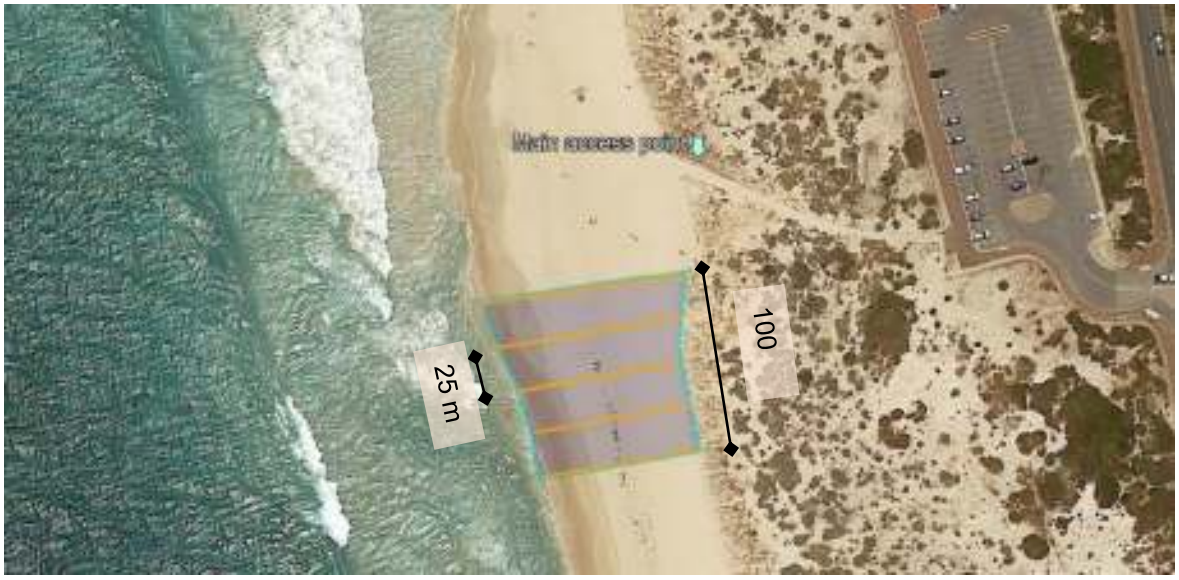



Figure 26. Example of a beach site showing the boundaries to the sampling area (blue lines and shading). The area is approximately 25 m away from the main access point. The high shore (top, along the vegetation) site boundary is 100 m. Transects (orange lines) are spaced every 25 m and run perpendicular to the slope of the beach, down to 2m before the waterline (the top of where the waves are washing up to). Each transect is 6 m wide.

Extra care should be taken on exposed, high-surf beaches, where there can be intermittent large waves. Transects can be higher up on the shore (5 m or more from the water edge) in these cases to ensure safety.

**Detailed process for counting litter at beaches:**

1. **Beaches should be audited some time in between two hours before or after low tide**.
   You can access the tide tables for your site from the Bureau of Meteorology Tide tables webpage[10] or another trustworthy source. Assistance on reading tide tables is provided in Section 0
2. Find the starting location of the first transect at the rear of the beach.
5. Fill out the relevant information on the Transect Information form as per Section 6.2.
3. Lay out the measuring tape from the high-side of beach down to the water-side of the beach, stopping 2 m back from the highest extent to which water is reaching on that tide (i.e. 2 m back from where the biggest waves are lapping onto the beach). The transect end point will differ depending on the level of the tide and wave action. A compass bearing can be used to point you in the direction of the end point from the start point.
4. Record the transect length.
5. Start walking along the first side of the tape measure, 1.5 m out. Record any litter that comes within 3 m of the tape measure, using a measuring tape to check any that are borderline.
6. Attempt to count litter 2 m into the back of the beach (i.e. any litter 2 m into the dunes or vegetation above the high-side transect mark). You should not walk into these areas, but record what you can see from the end of the transect (Figure 25). Update the Transect Information form to flag if this area was audited or not, or mark if there was a hard engineered barrier at rear of beach such as a sea wall or raised boardwalk.
7. Repeat the process on the other side of the tape measure.
8. Once both of the sides of the tape measure are counted, the transect is complete and you can move on to the next transect.

**Key points to remember for beach transects are:**

- Each of the transects can be different lengths, depending on the shape of the beach. As such, it is important to measure all of the transect lengths.
- Litter protruding from the sand or seaweed should be counted.
- You should not sift or dig through the sand looking for additional buried litter.
- Litter is recorded 2 m into vegetation at the back of the site as this is a key accumulation point. However, it is important that you should not enter this area to prevent damage to sensitive vegetation. If there is an engineered structure such as a sea wall, raised path or boardwalk at the back of the beach instead of vegetation/dunes, then do not sample the area. Update the '2 m into dunes/rear vegetation surveyed' and 'engineered structure at back of beach' fields on the Transect Information form.
- While transects are laid out based on the site GPS points, they can be moved slightly to avoid running over people and their possessions on the beach. There may be some cases where this cannot be avoided. In these situations, transects may need to be

[10] Bureau of Meteorology Tide tables:
http://www.bom.gov.au/oceanography/projects/ntc/tide_tables.shtml

walked without the tape measure and any area not surveyed estimated and recorded. A measuring wheel can be used to estimate the length where it is not practical to run a tape measure. In warmer months, preference should be to monitor beaches in the morning or afternoon (while still considering the tides) to reduce the challenges associated with avoiding people on the beach.

- It may be efficient to walk along and identify the start points for all the transects with flagging tape or other markers at the start of audit process.

## Main roads

**Main roads have six transects**. These are represented as transect pairs (1 & 2, 3 & 4, 5 & 6) where each pair covers both opposite sides of the same area of road.

Surveyors walk along these transects, counting litter as they go. Transects:

- are 100 m long (+/- 10 m)
- in pairs on both sides of the road
- are separated by about 50 m
- start 4m out from the edge of the road (the road line at the edge of the road), are 3 m wide with surveyors walking down the middle of the transect, counting litter counting litter 1.5 m either side of where they are walking (Figure 27).

An example of main road transect layout is shown in Figure 28.

Main roads are potentially dangerous environments. **No work should be undertaken on main roads without informing relevant road authorities and obtaining any required permits.** Avoid standing within 4 m of the road edge and be aware of traffic at all times. Snakes may also be a risk, particularly in long grass. Follow the extra safety precautions below.

### Extra safety precautions for main roads

Passing traffic is a key risk to litter surveys on main roads. Additional equipment and practice are required to ensure the AusLM is implemented safely. These are noted to be generic approaches for reducing risk and they should be complemented with a jurisdiction-specific assessment of safety requirements and notifications.

Key work practices to promote safety at main road sites are documented below.

### Parking

- Vehicles need to be parked clear of moving traffic (at least 3 m from the edge of the road) and should not impede the sight distance of other road users.
- Vehicles should be preferably parked on nearby road or side streets or similar.
- When turning off the main road to park, surveyors should ensure they indicate and gradually slow down well ahead of pulling off the road.

### Signage

- A Roadworks Ahead (or equivalent) sign should be placed ahead of the area to be surveyed to warn oncoming traffic that surveyors will be on the roadside.

- The sign should be placed in accordance with jurisdiction-level requirements for signage (e.g. 1 m away from the edge of the road and 100m either side of the audit site).

**Conducting the litter count**

- Always remain at least 4 m from the road edge when auditing.
- Walk against traffic where possible to improve your visibility of and to oncoming traffic.
- Ensure the site is established with good sight lines (i.e. not on corners – the site selection guide indicates you should have visibility of 250 m or more of oncoming traffic).
- Wear high visibility vests and sturdy footwear at all times.
- Use a spotter to help cross the road safely. The spotter can watch for traffic whilst you are auditing and while you cross the road.

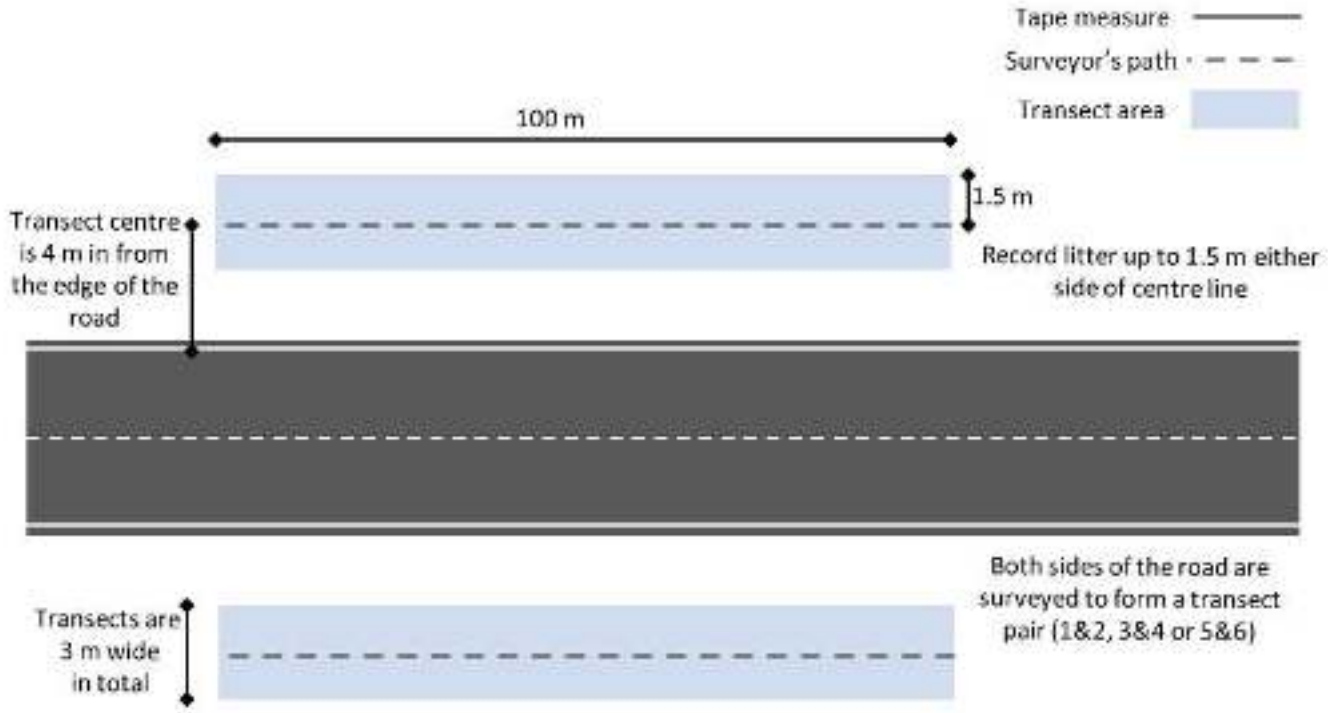



Figure 27. Approach to surveying transect at a main road site


Figure 28. Example of how the six transects (orange lines) at a main road site are positioned, with a 50-m gap between them. Transects are laid out in pairs on opposite sides of the road (1 & 2, 3 & 4, 5 & 6).

**Detailed process for counting litter at main road sites:**

1. Go to the start of the transect. See Finding the transect start and end points in Section 0.
2. Fill out the relevant information on the Transect Information form as per Section 6.2.
3. Measure out 4 m from the edge of the road. This becomes the centreline marker that you will walk from as you move between the start and end of the transect, always keeping 4 m from the edge of the road.
4. Searching for litter 1.5 m either side of your walking path.
5. At several intervals during your audit, use the tape measure to check you are keeping 4 m from the edge of the road for safety.
6. If you need to step out to one side to inspect an item of litter, try to keep one foot on the centreline so you can easily return to the centreline and continue walking forward.
7. Once you reach the end, move on to the next transect. Note that the transect on the other side of the road does not have to be surveyed immediately after its adjacent pair. You may find it more efficient and safer to survey all transects on one side of a road, before walking back and surveying all on the other side of the road.

## 6.5 Picking up litter during the count

Whilst litter is not picked up at sites involved in the official AusLM monitoring program, it is understood that other groups and individuals may want to pick up and remove litter from the sites they are auditing. AusLM allows the flexibility for this to occur, however, there are some minor changes and extra considerations that need to be considered.

1. **Ensure the 'Litter will be picked up' field is set to 'Yes' on the Site Information form.**
2. Surveyors need to take extra care if handling litter to avoid potential injury or transmission of viruses and disease. Ensure all surveyors picking up litter are wearing appropriate gloves.
3. Litter pickers tools should be considered for use to avoid direct contact with litter and constant bending down/back strain.
4. Litter picked up should be categorised into recyclable and non-recyclable categories (as a minimum) based on the local waste management and recycling scheme.
5. Litter picked up should be placed in tubs or plastic bags and disposed of appropriately according to local waste management arrangements.
6. Illegal dumping and hazardous waste (chemicals, possible asbestos) should be reported to the relevant council to trigger their response processes and for data monitoring purposes.

# 7 Frequently Asked Questions

The following responds to questions asked by surveyors during AusLM piloting and fieldwork.

***Should we count litter on top of hard surfaces such as public benches and tables?***

Yes, litter on top of hard surfaces should be counted provided it is less than 2 metres above the ground. One exception to this is litter left on top of **private retail food-related outdoor tables**, as these items will likely be cleaned up by the retail outlet. Looking at the image below, both bottle on top of the concrete seat and straw in the garden bed should be counted.

***Why do we not count litter items under 2.5cm?***

Items 2.5 cm and larger can be easily observed on the ground from a standing stance. The ability to detect smaller items starts to become more questionable. Most litter items of interest to AusLM are greater than 2.5 cm in size. There is a need to define a clear minimum item size and 2.5 cm was selected.

***Can litter under 2.5cm be counted if it is definitely identifiable as a singular item?***

Unless the item is one of the noted exclusions (cigarette butts, bottle tops, lids and bottle caps, and can ring pulls), then items less than 2.5 cm should not be counted unless the jurisdiction/organisation has made a special request or decision to action this amendment. Even if captured on the litter count form, these items would be disregarded in the official AusLM Reporting.

***How do you categorise something that is made of multiple components (e.g cigarette packet wrapped in plastic)?***

As outlined in section 0 Additional litter counting rules, each distinguishable component should be counted. The cigarette packet and plastic wrap would be counted as separate items (Paper & Cardboard -> Cigarette packets; Plastic -> Cigarette packet cellophane wrap).

***What is the definition of a public building?***

Schools, churches, libraries, hospitals, aged-care facilities are common examples of public buildings. This relates to completing the 'What is nearby' section of the Site Information form where 'Public buildings' is an option.

***What do I tell the general public or authorities if they question what I'm doing (counting litter)?***

A standard response has been captured in a document titled 'Responses to questions from the public' to assist you. This should be printed and kept in the AusLM toolkit.

***What is illegal dumping?***

The illegal dumping of waste is a form of littering at a larger scale that is usually planned and intentional. Dumping can occur at different scales from common small-scale dumping on urban nature strips involving a few household items to very large dumping in remote bush areas. Illegally dumped waste can be a source of litter where litter is blown or washed away from the central illegal dumping site into the neighbouring environment. Abandoned shopping trolleys should be counted as illegal dumping.

***Where do I record…***

| | |
|---|---|
| ***Paper confectionary wrapper items?*** | Paper & cardboard -> Other paper & card |
| ***Pieces of bitumen?*** | Other materials -> Construction materials |
| ***A tennis ball casing (outer cover)?*** | Cloth -> Other cloth item |

***Why is chewing gum not counted?***

Generally *chewing gum is < 2.5cm in size. This item can be counted if desired, but it will not be reported in the official AusLM reporting.*

***Should I count litter on the other side of a fence/temporary fence?***

Assuming that the fence forms part of the transect boundary, then you should only count litter on the transect-facing side of the fence. In the image below, the surveyor is auditing litter on the left-hand side of the fence. The take-away food cardboard container is on the right-hand side of the temporary fence that defines the transect boundary and therefore would not be included in the count.

# 8 Annex

## 8.1 Safety

### Needles, Syringes and Sharp Objects

Used syringes are potentially dangerous and it is important to prepare for their removal. The AusLM toolkit contains a sharps container and disposable gloves that you will need for the safe removal of syringes.

**Steps to follow for removal of needles and syringes:**[11]

1. Retrieve the sharps container from the AusLM toolkit.
2. Put on a pair of latex or plastic gloves. Needle stick, puncture and cut resistant gloves can be worn if available. Avoid thick gloves, such as gardening gloves, which make it difficult to pick up the needle and syringe.
3. If the needle and syringe is difficult to reach, carefully remove rubbish or other material around it so that you have direct access to it.
4. If there is more than one needle and syringe, separate them using a stick or the end of a broom. Do this carefully. Each needle and syringe can then be picked up individually.
5. Move the sharps container should be close to the syringe. The container should be on a stable surface and not held by hand.
6. Pick up the needle and syringe by the barrel (plastic end). Do not pick it up by the needle end. Make sure the needle is pointing away from you.
7. Never recap a needle and syringe, even if the cap has also been discarded.
8. Place the needle and syringe, needle end first, into the sharps container provided in the AusLM litter audit toolkit. Alternatively, use a plastic bottle that contains a sealable lid. The container should be on a stable surface and not held by hand.
9. Take off the gloves and put them in the rubbish bag supplied in the AusLM toolkit or place the needle stick, puncture and cut resistant gloves in a bag for cleaning at the end of the day.
10. Wash your hands with soap and water.
11. Once full, dispose of the container by taking it to your local Needle and Syringe Program or council office or contact the Disposal Helpline (1800 552 355) for further advice.
12. Make sure you restock the AusLM toolkit with gloves and a new sharps container.

[11] These steps were referenced from the VicHealth 'Safe retrieval and disposal of needles and syringes' guide and slightly modified to accommodate recommended improvements.

## Hazard risk matrix

This matrix lists common hazards surveyors may encounter whilst undertaking field work. A description and mitigation measures are provided for each hazard to help eliminate or reduce the risk of the hazard. The mitigation measures must be implemented if a hazard is identified at a site.

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| Slip & trip hazards | Areas of wet grass or mud, unstable sand or gravel, leave litter or similar are all potentially slippery surfaces. The risks of slipping are exacerbated by sloped or uneven ground. Trip hazards include any raised surface, such as rocks, edging, garden beds or uneven ground. May result in falls and injury. | • Walk slowly and carefully. If areas are very slippery/steep, they can be excluded and estimated and add to the 'area not audited' section of the Transect Litter Count form.<br>• Ensure you are wearing hard bottomed, non-slip, steel-capped boots/shoes. |
| Steep gradients | Steep slopes (>45$^{o}$) should be avoided as part of the AusLM. | • Note this hazard on the Transect Information form.<br>• If only a small area, avoid it and estimate the area not audited and add to the 'area not audited' section of the Transection Litter Count form.<br>• If a larger area within the transect, attempt to move the start/end points of the transect to avoid the steep area. Make sure you note the updated start/end GPS points and take new photos of the start/end points.<br>• If the entire site is steep, make a note on the Site Information form and notify your supervisor and plan to audit an alternative site. |
| Fire/Bushfires | Fire may be a risk in peri-urban or regional sites adjoining bushland or grassy fields. Uncontrolled bushfires or fires that could get out of control that are burning in or around the city or neighbouring areas pose a risk to your safety. | • Avoid auditing if there are any active bushfires or burning off in the local or neighbouring areas.<br>• Follow guidance from the relevant jurisdiction-based Fire Authority and leave any high-risk areas as advised.<br>• Always monitor the weather conditions. Fire Danger Ratings for each jurisdiction can be found towards the end of this Bureau of Meteorology webpage.[12] |

[12] BOM Fire weather services: http://www.bom.gov.au/weather-services/fire-weather-centre/fire-weather-services/

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| | | • Avoid auditing if the Fire Danger Rating is Severe, Extreme or Catastrophic/Code Red. |
| Weather events | Key dangers to be aware of are lightning, strong winds, rain and hail. | • Take note of the weather forecast the night before and morning of your planned audit work.<br>• If any extreme weather events are forecast you should note their time (morning or afternoon or all day) and avoid auditing during these times.<br>• If you get caught in an extreme weather event (rain, storm, hail), return to your vehicle and wait for conditions to ease or until it is safe to drive back to your planned end of day destination. |
| Cold weather | Long term exposure to very low temperatures could lead to hypothermia – a condition where the body's temperature drops below 35$^{o}$C. Hypothermia can be fatal.<br><br>Initial symptoms of hypothermia include: feeling cold and uncontrollable shivering – note that shivering may stop in more advanced stages. Other symptoms include feeling exhausted and having cool and pale skin. More advanced symptoms include: fumbling hands, unsteady | • Take note of the weather forecast the night before and morning of your planned audit work.<br>• If temperatures below 10$^{o}$C are forecast then you should be extra vigilant of hypothermia symptoms and take more frequent breaks in a warm environment such as inside your vehicle and keep energy levels up through regular snacks. Ensure you dress appropriately with warm layers and an outer shell to stop wind exposure.<br>• If you experience any symptoms of hypothermia, then ensure you tell another surveyor at the site and you should both return to a vehicle or sheltered space to further assess your condition. Notify your supervisor of the situation. Do not use direct heat such as a fan heater to warm up; use warm blankets, towels or skin to skin contact. Do not massage or rub the person.<br>• Seek medical advice if symptoms persist. |

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| | gait, slurred speech, confusion and drowsiness.[13] | |
| Sun exposure | A risk for virtually all sites, sun exposure is important to manage to avoid heat exhaustion and sunburn. Areas such as beaches where UV is reflected from water and there is minimal shade are particularly risky. Exposure to hot weather can lead to heat exhaustion (symptoms: heavy sweating, heat cramps, paleness, weak or dizzy, nausea or vomiting, fast, weak pulse, headache) or heat stroke (slurred speech, poor coordination, seizures or losing consciousness).[14] | • Take note of the UV index rating for your area. The ARPANSA website contains ratings for major cities.[15]<br>• Always apply a broad-spectrum sunscreen with a minimum SPF 30+ to all exposed skin.<br>• On days where the UV index if forecast to be high, very high or extreme, or the temperature is expected to exceed 30°C, you should take common precautions such as wearing a light long sleeve shirt and pants or clothes that cover the legs, wear a broad brimmed hat and sunglasses to protect your eyes.<br>• Keep well hydrated.<br>• If you experience any symptoms of heat exhaustion, stop work, notify another surveyor, find a cool shady space and begin treatment (drink water, rest, assess if symptoms are severe and further medical advice is required).<br>• If you experience any symptoms of heat stroke or notice anyone else with these symptoms, then stop work, notify another surveyor, call 000 and follow their advice, find a cool shady space and begin treatment by drinking water and applying water to the body and clothing to cool the body and fan to create a cool breeze. |
| Moving vehicles/traffic | Any street, roads, highways or driveways should be treated with great caution. There is a | • No work should occur on major roads without informing relevant road authorities and obtaining any required permits.<br>• Always wear high visibility vests when auditing sites in proximity to moving traffic.<br>• Use appropriate roadside signage when working on major roads or main roads. |

[13] More information about Hypothermia can be found on the NSW Health website: https://www.health.nsw.gov.au/environment/factsheets/Pages/hypothermia.aspx#:~:text=Hypothermia%20occurs%20when%20the%20body,their%20need%20for%20medical%20attention.

[14] More information about heat exhaustion and heat stroke can be found on the QLD health website: https://www.health.qld.gov.au/news-events/news/difference-between-heat-exhaustion-and-heat-stroke-dehydration-heatwave

[15] ARPANSA Website: https://www.arpansa.gov.au/our-services/monitoring/ultraviolet-radiation-monitoring/ultraviolet-radiation-index

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| | risk of being hit by vehicles or cyclists which could result in serious injury or death. | • In areas where traffic may be travelling faster than 60km per hour, ensure there is a 3 m distance between you and the edge of the road.<br>• Always walk towards oncoming traffic when auditing a transect where you are on the road side of the transect centre line.<br>• Safety can be enhanced by using a dedicated spotter when crossing the road and whilst auditing the transect.<br>• Safety can be enhanced by working with the local road authority to conduct the audit.<br>• Do not work on corners of the road where there are not good sight lines. You should be able to see 250 m of oncoming traffic. |
| Pedestrians and cyclists | Footpaths and tracks are a key sign to be aware of pedestrians and cyclists. A collision between you and a pedestrian or cyclist could result in injury. | • Always wear high visibility vests when auditing sites in proximity to pedestrians or cyclists.<br>• Be patient, look up and around in all directions, walk carefully<br>• Avoid walking on cycling paths. |
| Falling objects | This might be a risk when surveying areas with overhanging trees. Coconut-bearing trees in the tropics are worth particular consideration. Head and body injuries may result if struck by a falling object. | • Avoid surveying litter directly under coconut-bearing trees. Estimate the area not audited and add it to the Transect Litter Count form.<br>• Be extra mindful of falling branches in parks, especially on windy or very hot days.<br>• Do not audit sites during very strong winds or storms. |
| Water/flood risks | Potentially an issue at sites adjoining creeks and rivers, or in other areas during periods of extreme rain such as during the wet season in northern areas. Being submerged under water could lead to drowning. | • Take note of the weather forecast the night before and morning of your planned audit work.<br>• Avoid auditing sites in actual or forecast heavy rainfall events.<br>• When traveling between sites, never cross flooded rivers or roads covered with moving water.<br>• Do not audit near or around flooded rivers or rivers that are rising and may burst their banks. |

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| | Working on beaches also poses a risk. Ocean waves can sweep you out to sea and on the beach there is a risk that you could be trapped or cut-off from a safe location due to the rising tide and wave action. | • At beaches, don't turn your back on the sea whilst close to the water's edge unless you need to walk to the back of the beach.<br>• At beaches, always stay alert to the presence of waves that may sweep you out to sea and as directed, place the transect end point 2 m back from the reaching waves.<br>• At beaches, as directed, audit sites between 2 hours before or after low tide to reduce the risk of being trapped at the rear of the beach. |
| Dangerous animals | Snakes, spiders and other dangerous venomous animals pose a risk at a variety of sites, particularly main road and park and beaches. Areas of tall grass, bushes, rocks, fallen trees and leaf litter should be treated especially cautiously. Spiders might be a risk in leaf litter or bushes. Jellyfish, stingray barbs and other marine life such as cone fish pose a risk on beaches where they may accidentally be stood on or handled.<br><br>Dog attacks could be a risk in areas where they are often found off-leash or in large packs. Mosquitos and sandflies may be problematic near water.<br><br>Other dangerous animals that might be considered, depending on location are ticks, swooping birds (specifically in spring or nesting season when birds are protecting chicks) and crocodiles. | • Ensure all surveyors are made aware of the increased risk of the presence of snakes, spiders or other dangerous animals.<br>• Wear long pants and protective boots.<br>• Use the litter poking stick to inspect bushes or long grass.<br>• Do not pick up foreign items on the beach (except when wearing gloves to remove syringes, needles and glass)<br>• Wear a hat and sunglasses to reduce risk of injury from swooping birds. If you experience a swooping bird whilst auditing, then decide if the risk of injury can be reduced by asking another surveyor to act as a spotter and to keep eye contact with the swooping bird(s). If the risk of attach and injury is too high, then abandon the audit of the transect and identify an alternative transect.<br>• Avoid working in areas of known crocodile habitat. Seek advice from local council for clarification and advice.<br>• Do not approach dogs on or off lead. If you come into contact with an aggressive or menacing dog, avoid eye contact, stay still, keep hands by side, after a period of time, slowly back away.<br>• If a snake is seen or reported on site: Note the area of the snake and stop work in this area until the hazard is removed. Notify everyone around you about the presence of the snake. DO NOT approach, attack or otherwise provoke the snake. Leave a 10 m exclusion zone around the snake and this area is not to be audited and instead added to the 'area not audited' field on the Transect Litter Count form. |

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| | | If possible, contact local council or an appropriate handler to request the snake be removed.<br>• Follow First Aid guidance for all bits, stings or wounds from dangerous animals. |
| Physical violence or verbal abuse | This could be an issue at any site, but particularly public areas where people might under the influence of drugs or alcohol. | • Do not approach people who appear to be under the influence of drugs or alcohol unless you deem you have a duty of care and they are in need of immediate medical assistance.<br>• If you feel uncomfortable, threatened or unsafe, then walk away from the situation and meet up with any other surveyors at the site, or walk back to your vehicle.<br>• Do not cause the situation to escalate by engaging in arguments or conversation. |
| Needles, syringes, sharp objects | Sharp objects in transect areas being audited could cause cut and puncture wounds with risk of disease or infection. | • If you observe a sharp object, walk around it and notify other surveyors of its location.<br>• As a general rule, surveyors should pick up needles and syringes at all locations and place them in the sharps container, or contact a local service provider to deal with the hazard. Instructions on how to safely remove needles and syringes are documented in section 0.<br>• As a general rule, surveyors should pick up glass at parks and beaches where they pose a heightened risk to public safety. If picking up the glass is not possible or will take a considerable amount of time, then notify local council to address the issue.<br>• Always wear protective footwear.<br>• Always wear protective gloves if removing sharp objects. |
| Virus infection and transmission | Viruses such as influenza and COVID-19 pose a risk to your health and those around you. | • Follow the specific instructions in Section 10 Keeping COVIDSafe for measures you need to take to reduce the risk of virus infection and transmission. |
| Fuel/Chemicals | Fuel or chemical in containers or in a spill event creates a hazardous environment that could | • Avoid the area and take precautions to keep other people away from the area.<br>• Assess the situation. If the item (e.g. a drum/container) contains a clearly labelled non-hazardous substance that can be safely handled, then the item should be moved to a temporary safe location at the site. |

| Hazards | Hazard description | Mitigation – Actions to reduce or eliminate risk |
|---|---|---|
| | result in burns to the skin, damage to eyes, respiratory system or an explosion. | • For all substances (hazardous - fuel, oil, acid, or non-hazardous), call council and request their assistance to remove the items found, or follow the guidance council provide.<br>• Keep a 20 metres buffer around the item and continue to audit the site.<br>• Estimate the area not audited and add to the 'area not audited' section of the Transection Litter Count form. |
| Asbestos | If inhaled, asbestos fibres can result in a long-term serious rehabilitating illness or death. Asbestos was commonly used as a construction material for walls, ceilings and cladding. It is most likely to be found in cement sheets (rigid pieces) in piles of illegal dumped building materials. | • Avoid the area and take precautions to keep other people away from the area.<br>• Call council and request their assistance to remove the items found.<br>• Keep a 20 metres buffer around the item and continue to audit the site.<br>• Estimate the area not audited and add to the 'area not audited' section of the Transection Litter Count form. |

## 8.2 Litter item list and definitions

There are approximately 120 different litter items on the Transect litter count form, plus additional sub-categories for the different sizes of beverage containers and fragments. Litter item types are grouped according to their material type. The Transect Litter Count form groups litter items into broad categories of:

- Beverage containers
- Unidentified fragments
- General litter items, including cigarette butts

### Beverage containers

Table 8 below provides some example litter items for each material type and contents combinations recognised by AusLM. Abbreviations of contents used in the Transect Litter Count form are listed in brackets after the full wording for some items.

Table 8. Beverage container types and contents for the AusLM.

| Contents | Examples |
|---|---|
| Drink pouches[16] | Soft flexible plastic beverage containers, usually small (< 300 ml), containing a range of products such as juice drinks. |
| Flavoured milk | Milk usually mixed with sugar/sweetener and flavouring. Common flavoured milk brands include Big M, Oak, Dare, Ice. |
| Soft drink, Flavoured water, Fruit Juice Drink, Sports Drink, Energy drinks (Soft drink/FW/FJD/SpD/ EnD) | This category includes drinks that are carbonated (fizzy) and non-carboned.<br>Common soft drink brands/products include those from the<br>Coca-Cola, Schweppes, Pepsi & supermarket brands.<br>Flavoured water products include Aqua Pura Fruit Splash.<br>Fruit Juice Drinks are made from a mix of fruit juice (~ 20–35% fruit juice) and water, mineral water or mineralised water. E.g Fruit juice boxes/juice poppers.<br>Sport drink common brands include: Powerade, Gatorade, Maximus.<br>Energy drink common brands include V, Red Bull, Monster, Mother.<br>This category of drinks also includes ready to drink cordials, kombucha and vitamin drinks. |
| Fruit/vegetable juice | 100% fruit and vegetable juice drink products with common brands such as: Berri, Pureharvest, V8. |

[16] Whilst drink pouches do not describe the contents of the beverage container, they are a unique item that AusLM wants to measure and it makes logical sense to include them in this section.

| Contents | Examples |
|---|---|
| Water | Commonly water product brands include: Mount Franklin, Cool Ridge, Fiji Water and supermarket brands. |
| White milk | Plain unflavoured milk in bottles or cartons with brands such as: Murray Goulburn, Dairy Farmers, Pura, Pauls, Devondale and supermarket brands. |
| Wine | Includes alcoholic and non-alcoholic wine (fermented grape). |
| Spirit | Includes pure spirituous liquor such as Baileys Irish Cream), distilled alcoholic beverage such as rum, scotch, vodka, gin whisky. |
| Premixed spirit drinks | Blend of alcoholic spirt and other mixer beverage. Common brands/examples include: Bourbon and cola drinks, Vodka Cruiser, UDL. |
| Beer | Includes all alcoholic and non-alcoholic beer, ale, stout. |
| Cider | Alcoholic fermented juice such as apple and pear. |
| Wine-based/wine cooler | Wine-based flavoured alcoholic beverage that contains wine plus additional beverages, ingredients or flavours such as:<br><br>fruit flavoured wine, wine coolers.<br><br>Flavoured alcoholic beverages with a wine base — any beverage that contains wine plus additional beverages, ingredients or flavours. This can include fruit flavoured wine and wine coolers |
| Other beverage | A catch-all for any other beverage type not listed above. |

**Unidentifiable Fragments** have been sufficiently explained in section 0 Unidentifiable Fragments and won't be explored in more detail here.

## All general litter items

The following tables contain a list of all litter items recognised by AusLM. You should be familiar with each item. Photos of difficult to identify/classify items are provided.

**GENERAL LITTER ITEMS**

| Litter item category | Litter item | Description |
|---|---|---|
| Plastic | Bag - Dog Poo |  Usually smaller ~10 x 20 cm thin plastic bags |
| | Bag - Fruit/Veg |  Thin plastic bags often available from green grocers and supermarkets for holding fruit and vegetables |
| | Bag - Green Reusable |   Reusable bag made from polypropylene plastic. These bags feel more like a fabric. |
| | Bag - Heavy Boutique |    Thicker than lightweight single-use plastic bags |
| | Bag - Heavy Supermrkt |  |

| | | |
|---|---|---|
| | | Thicker than lightweight single-use plastic bags |
| | Bag - Ice | Plastic bags used to store ice that is commonly purchased from service stations/supermarkets or bottle shops. |
| | Bag -Lightweight shop – (Blue, grey, white, other) colour | AusLM has four litter items to classify these single-use lightweight shopping carry bags. Each item is classified by its colour (blue, grey, white or other colour)<br>  |
| | Bag - Mesh Bags |  |
| | Bag – Other | All other types of soft plastic bags, including ziplock bags.<br>   <br>  |
| | Bread bag tags/twist ties | Hard plastic tags used to seal bread bags and similar items. Twist ties have thin metal wire coated in plastic or paper that is typically used to wrap around and close/tie off a soft plastic bag/bread bag/similar bag. There is also a bread bag tag item under paper and cardboard category. |
| | Cable ties | Also known as zip ties. |
| | Cigarette butts & filters | ** Listed on the first page on their own. |

| | | |
|---|---|---|
| | | Includes unlit cigarette or cigar, or the remaining butt or filter.<br>   <br>  <br>[17] |
| | Cigarette Lighters |  [18] |
| | Cigarette packet cellophane wrap | The typical small pack of 20 cigarettes has a wrapper of approximately 6 cm x 6 cm in size.<br>  |
| | Cotton buds/tips | Sometimes referred to as a cotton swab or tip. The shaft is made of plastic. There is a separate category for products with non-plastic shaft in 'other materials.<br>  |

[17] Image credit: Bianca Gray, Queensland Department of Environment and Science
[18] Image Credit: Colorful lighters in a row on purple background by Bogdan Dreava from Noun Project

| | | |
|---|---|---|
| | | |
| | Cup - single use | Made from lightweight flexible plastic used to serve cold drinks. Designed for single use, though in reality, could be reused a number of times.  |
| | Cup – reusable | Rigid, more durable plastic cups that can washed and reused numerous times. For example, a reusable coffee cup. |
| | Cutlery/chopsticks | Includes plastic knife, fork, spoons, chopsticks and similar eating utensils. |
| | Fishing related | Includes fishing line, lures and other plastic fishing items |
| | Food/Confect. wrappers | Includes chip packets, lolly wrappers, ice cream wrapper    |
| | Lids - Beverage container lids /caps | Includes lids that screw on or clip onto bottles.   |
| | Lids – Plastic cup lid | Includes lids that fit on take-away drink cups or frozen ice drinks. |

| | | |
|---|---|---|
| | |   |
| | Lids -Coffee cup lid |  <br><br>Includes similar style lids from hot chocolate or other similar hot beverages. |
| | Lids - Plastic (other) | Other lids may come from bottle of creame, oil, fuel, shampoo, and chemicals etc.<br><br>  <br><br>*Image source:* Professor Stephen Smith |
| | Lollipop Sticks | Short plastic stick used to hold lollipops. |
| | Non-Food Bottle | Includes all non-food related plastic bottles such as those from cleaning products, cosmetics /toiletries, car products. |
| | Non-Food Package | Includes plastic packaging that might be associated with small electronic goods (headphones, batteries) or hardware items (screws, nails) |
| | Other Food Package | Includes items such as soy sauce fish, sachets, small containers or squeeze packs of sauce or condiments (e.g. |

| | | |
|---|---|---|
| | | tomato sauce or wasabi, ginger, tartar, mayonnaise). Also includes the lids of these containers if found separately and are larger than the minimum size. |
| | Plate/bowl – single use | Single-use plastic plates or bowls that typically use thin flexible plastic designed for one use only. |
| | Plate/bowl – reusable | More durable rigid plastic used to create reusable plastic plates or bowls. |
| | Vehicle parts | Car, truck, bike parts. Most likely to be found on roadsides. |
| | Plastic wrap non-food | Includes plastic wrap that might be used around goods or pallets. Excludes cigarette packet cellophane wrap. |
| | Six pack rings | Soft plastic rings used to hold a group of cans together. |
| | Stirrers | Small rigid plastic sticks used typically used for stirring sugar or milk into hot drinks. |
| | Strapping band | Firm, strong woven plastic band/strapping, often used to wrap around boxes, goods or pallets.<br>  |
| | Straws |  <br>Only plastic straws included here. |
| | Syringe | Used for injecting or dispensing medicine. Follow sharps safety instructions of a needle is present. (Section 8.1.1) |
| | Takeaway food container | Often found as rectangular or cylindrical shaped tubs used for storing take-away food.<br>Excludes small condiment containers. These are categorised under ‘Other Food Package’ |
| | Tape/narrow soft plastic film | Includes any length (above minimum size) of common tape products (sticky tape, gaffe tape, electrical taps), or other soft plastic film |
| | Tobacco pouch | Soft plastic pouch that contains tobacco for smoking. Usually has a flap that folds over. |
| | Toys | All plastic toys. |

| | | |
|---|---|---|
| | Vape packaging | Packaging for vape pens, or vape related products. May be plastic wrap or metallicized plastic pouch. There is also a paper & cardboard category for vape packaging.<br>  <br><br>*Image source:* Professor Stephen Smith |
| | Whipper-snipper cord | May also be known as line trimmer cord. Thin flexible plastic cord that is typically between 1.6 mm and 2.7mm in diameter. The length of cord is variable pending how much has broken/cut off. |
| | **Other plastic item** | Captures all other identifiable plastic items that are not in this list or the plastic beverage containers list. |
| **Polystyrene** | Cups (foam) | Polystyrene/foam cup commonly used as a single-use cup for hot/cold drink. |
| | Food pack./clam shells | Polystyrene food package, often used to store take-away food. Where a lid closes on top of a container, these are often called clam shell containers. |
| | Insulation & Packaging | Includes polystyrene boxes and beads/balls used for insulation or cushioning. |
| | **Other polystyrene item** | Captures all other identifiable polystyrene items that are not in this list. |
| **Glass** | Glass jars | Glass jars commonly used for storing condiments. |
| | **Other glass item** | Captures all other identifiable glass items that are not in this list or the beverage containers list. |
| **Other materials** | Balloons | Includes balloons of all sizes and materials, inflated or deflated. |
| | Batteries | Includes all small button and larger batteries. |
| | Condom | Condom used/unused, with or without wrapper. |
| | Construction materials | Includes a range of construction materials such as timber off-cuts, screws, nails, bolts, insulation, plasterboard.<br><br>Excludes cable ties (See Plastic section) |

| | | |
|---|---|---|
| | Cotton buds/tips (non-plastic) | Sometimes referred to as a cotton swab or tip. The shaft should be made of cardboard, bamboo or some other non-plastic material. There is another item under the 'plastic' category for items with a plastic shaft. |
| | Cutlery (non-plastic) | Includes **non-plastic** knife, fork, spoons, chopsticks and similar eating utensils. |
| | Dog poo | Instance/pile of dog poo. |
| | Electrical wire | Insulated or uninsulated wire. |
| | Face mask – disposable |  |
| | Face mask – reusable | Reusable face mask. |
| | Fruit/vegetable/food | Whole items or partial items, including take-away food. |
| | Ice cream stick | May be wood or plastic. |
| | Nappy | Disposable or reusable nappies, used or unused. |
| | Personal Effects | Includes items ordinarily worn or carried by the individual such as wallets, handbag, watches, jewellery, mobile phone. If safe to do so, wear gloves, pick up the item and place it in a bag and hand it in to the nearest police station at your earliest convenience. |
| | Plate/bowl (non-plastic) | **Non-plastic** plate or bowl. |
| | Rope/string | Includes plastic or natural fibre-based rope/string of any length (greater than minimum size). |
| | Sanitary Items | Includes sanitary pads and tampons. |
| | Stirrers (non-plastic) | Small rigid **non-plastic** sticks used typically used for stirring sugar or milk into hot drinks. |
| | Straw (non-plastic) | Includes all non-plastic straws such as paper, bamboo, stainless steel etc. |

| | | |
|---|---|---|
| | Vape pen | Also known as e-cigarettes. Come in a range of shapes, sizes and colours. Typically, metal or plastic, around 2.5 cm in diameter and 11cm long.<br>  <br><br>*Image source:* Professor Stephen Smith |
| | Vehicle parts | Plastic, metal or composite car, truck or bike parts. Most likely to be found on roadsides.<br><br>Excludes: Tyres or pieces of tyres (see Rubber category). |
| | Wet wipes | Includes baby wipes or refresher tissues. |
| | Wooden item | Any wooden litter item found, including pencils. |
| | **Unknown item** | Used where you can't identify what a litter item is or where it should be classified. |
| **Cloth** | Clothing | Includes all items of clothing. |
| | **Other cloth item** | Captures all other identifiable cloth items that are not in this list. |
| **Paper & Cardboard** | Bread bag tag | Tags used to seal bread bags and similar items. Bread bag tags now come in cardboard form. There is also a bread bag tag item under the plastic category. |
| | Cigarette packets |  <br> |
| | Cup - Coffee cup | Paper/cardboard coffee cup |
| | Cup - Other paper cup |  |
| | Ice cream wrappers | Icy pole, ice-cream wrapper of any material |
| | Junk mail / free circulars | Promotional leaflets, catalogues and circulars. |

| | | |
|---|---|---|
| | Newspaper/Magazine | Newspaper or magazine. |
| | Packages & boxes | Includes cardboard boxes.<br><br>Excludes pizza boxes and takeaway containers. |
| | Paper bags | Paper bag, full or empty. |
| | Paper tissues/napkin | Includes tissues and napkins<br><br>Excludes wet wipes (see other materials category) |
| | Shopper dockets, tickets/receipts | Any paper dockets, receipts or tickets. |
| | Takeaway containers | Includes pizza boxes or the small boxes used to hold take-away hamburgers/fries. |
| | Vape packaging | Packaging for vape pens, or vape related products. There is also a plastics category for vape packaging.<br><br>  <br><br>*Image source:* Professor Stephen Smith |
| | **Other paper & card.** | Captures all other identifiable paper/cardboard items that are not in this list or the beverage containers list. |
| **Rubber** | Rubber band/hair tie | Rubber band or hair tie |
| | Rubber toy | Rubber toys or balls |
| | Tyre pieces | Pieces or car, truck, bike tyre. |
| | Tyres | Refers to truch/car/motorbike and bicycle tyres |
| | **Other rubber item** | Captures all other identifiable rubber items that are not in this list. |
| **Metal** | Aerosol cans | Any spray can such as spray paint can or fly spray.<br>  |

| | | |
|---|---|---|
| | Aluminium foil wrap | Includes aluminium foil commonly taken from used to wrap food products.<br>  |
| | Foil takeaway container |  |
| | Lids, bottle tops, can ring pulls |   |
| | **Other metal item** | Captures all other identifiable metal items that are not in this list or the beverage containers list. |

## Difficult to identify items

Plastic bags are an item of specific interest to AusLM. You need to be able to distinguish between two commonly used plastic bag types.

| | | |
|---|---|---|
| Lightweight, single use HDPE plastic bags | These bags have been banned or planned to be banned in all jurisdictions for use in retail stores as carry bags. These single use plastics bags have a thickness of 35 microns (0.035 millimetres) or less. They commonly have no branding or marketing printed on the bag. AusLM has a number of separate litter items to classify these under:<br>• Bag - Lightweight shop – blue colour<br>• Bag - Lightweight shop – grey colour<br>• Bag - Lightweight shop – white colour<br>• Bag - Lightweight shop – other colour<br>This type of bag can still be used as a ‘barrier bag’ for holding meat, fruit and vegetables. AusLM has a |   |

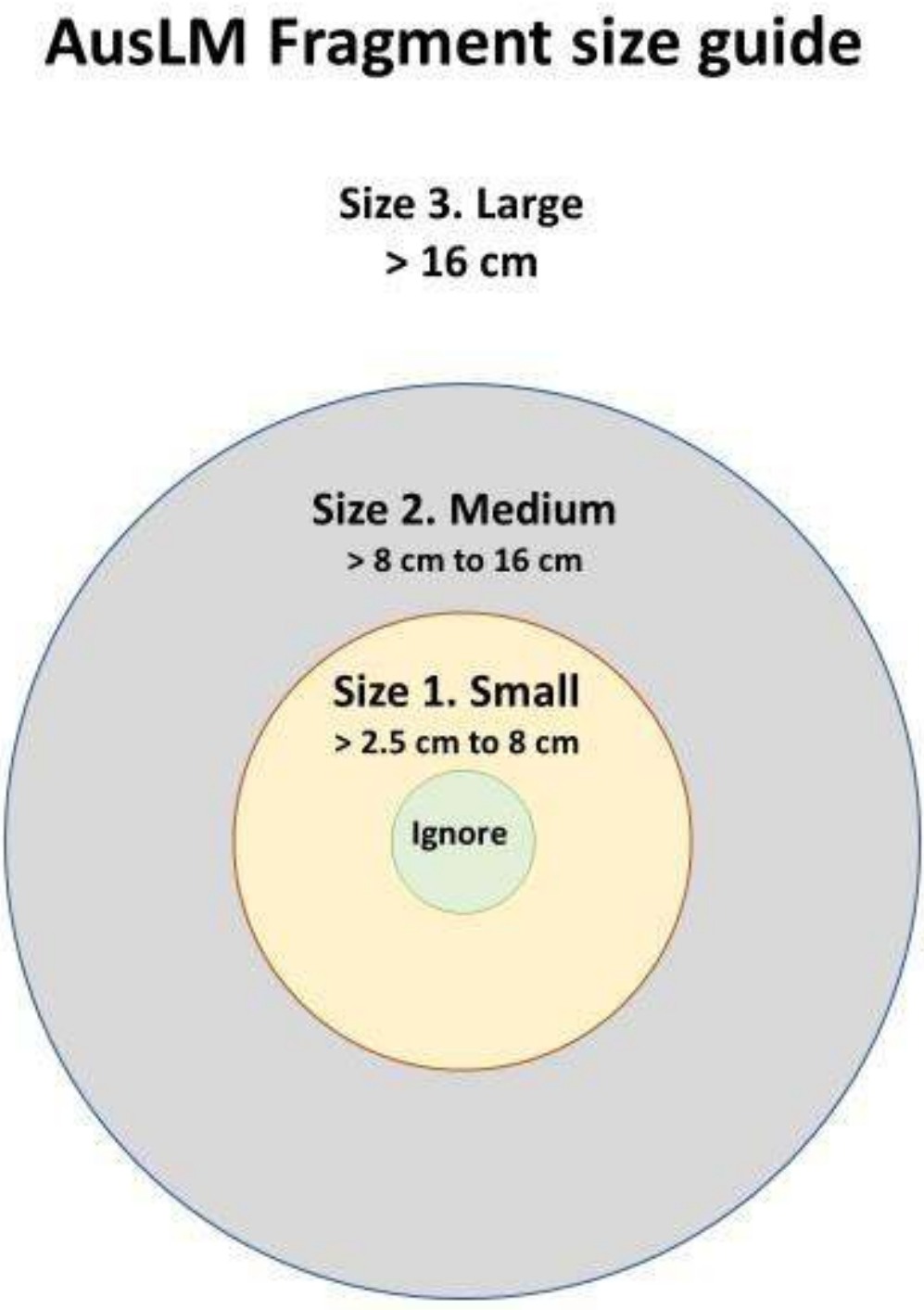
| | | |
|---|---|---|
| | separate litter item type called ‘Bag - Fruit/Veg’ for these. | |
| Thicker reusable LDPE plastic bag | Many retail stores such as supermarkets and department stores have switched from using lightweight single use bags to more durable, thicker LDPE reusable plastic bags. These commonly have brand/store marketing printed on the bags. AusLM has a separate litter item types called ‘Bag - Heavy Supermrkt’ and ‘Bag - Heavy Boutique’ for these. |  |

Examples of plastic used in both types of bags are included in the AusLM toolkit samples box. You should inspect both materials to aid you to identify these in the field.

There are many other types of plastic bags circulating in Australia that are marketed as degradable, biodegradable and compostable. Given the complexity of identifying and differentiating between the different types of plastic bags, the specific type of bag is not differentiated by AusLM.

**Fragment size classes**

**WARNING – This image is not to scale. Print a copy of 'AusLM Fragment size guide' in the AusLM electronic Resources Folder for use in the field.**




The centre circle is 2.5cm in diameter. This is the minimum size of items included in AusLM (noting some exceptions such as cigarette butts, bottle lids, bottle caps and can ring pulls).

## 8.3 Checklists

The following checklists are provided to support your AusLM work. These checklists are formatted ready for printing in a supplementary file: AusLM checklists.docx (or pdf). They are also included in this manual for easy referencing.

| Checklist | Purpose |
|---|---|
| AusLM pre-departure checklist | Check you have everything you need before heading out into the field to conduct audits. |
| AusLM Toolkit checklist | Check your AusLM toolkit is stocked with all the items needed. |
| AusLM Site Type Assessment checklist | Handy reference to assist with the Site Type Assessment task. The AusLM Fragment size guide is included on the next page of the supplementary file for easy double-sided printing of these two resources. |
| Site steps checklist | A handy reference for sticking on your clipboard to remind you of the key steps to complete at each site. |

## Pre-departure checklist

Purpose: Complete this checklist before leaving your home/workplace to undertake litter surveys. The guide will help ensure you have everything you need to complete the task.

**AusLM pre-departure checklist**

| | Required item/tasks |
|---|---|
| ☐ | List of sites to be audited in spreadsheet with hardcopy printout backup |
| ☐ | Print out of site satellite images showing transect locations |
| ☐ | Travel plan/auditing schedule |
| ☐ | AusLM Site Information forms x 15 |
| ☐ | AusLM Transect Information forms x 50 |
| ☐ | AusLM Transect Litter Count Forms x 50 |
| ☐ | Fully charged smartphone/tablet with GPS capability |
| ☐ | Smartphone Apps installed to support data collection |
| ☐ | Phone/tablet charging cable |
| ☐ | Check the weather forecast for the area(s) to be audited. Take note of forecast extreme conditions or temperatures, high fire danger ratings and storms. Review the Hazard risk matrix in Section 0 for details on how to respond to these events. |
| ☐ | Completed the AusLM toolkit checklist (Section 0 AusLM Toolkit Checklist) |

### AusLM Toolkit Checklist

Use this checklist to ensure the AusLM toolkit has all the required items. Items shaded in orange are optional for surveyors not participating in the official AusLM monitoring program.

# AusLM Toolkit Checklist

| | Item | Number |
|---|---|---|
| ☐ | First aid kit | 1 |
| ☐ | Measuring wheel | 1 |
| ☐ | Measuring tape (long – ~50 m) | 1 |
| ☐ | Measuring tape (short - ~8 m) | 2 |
| ☐ | Storage tub or small suitcase with handle & wheels | 1 |
| ☐ | Stringline | 2 |
| ☐ | Tent pegs | 5 |
| ☐ | Stakes | 6 |
| ☐ | Flagging tape | 1 |
| ☐ | Gloves | 2 |
| ☐ | Hand sanitiser | 1 |
| ☐ | Sanitiser wipes | 1 |
| ☐ | Rubbish bag | 1 |
| ☐ | Sharps container | 1 |
| ☐ | Face masks | 2 |
| ☐ | Clipboard | 2 |
| ☐ | Powerbank | 1 |
| ☐ | Litter poking stick 1.5 m long with a clear mark or tape wrapped at the 1 m mark. | 2 |
| ☐ | Chalk sticks | 2 |
| ☐ | High visibility vest | 2 |
| o | Sunscreen | 1 |
| ☐ | Samples box | 1 |
| ☐ | Items Size Guide & Site Type Assessment checklist | 2 |
| ☐ | Sample minimum item size guide | 2 |
| ☐ | AusLM cleanliness rating photo index | 2 |
| ☐ | AusLM Transect layout summary | 2 |
| ☐ | Responses to questions from the public | 2 |
| ☐ | Sub-sampling frame | 1 |
| ☐ | Tally counter (clicker counter) | 1 |
| ☐ | Compass | 1 |

**Legend**

| | |
|---|---|
| Orange shading | Optional item |

## Site Safety Assessment Checklist

If you identify any of these hazards at the site you are auditing, you could consult the Hazard risk matrix in Section 0 for more details and instructions to follow to reduce or eliminate the hazard.

| Hazards | Hazard description |
|---|---|
| Slip & trip hazards | Areas of wet grass or mud, unstable sand or gravel, leave litter or similar are all potentially slippery surfaces. |
| Steep gradients | Steep slopes (>45$^{o}$) should be avoided as part of the AusLM. |
| Fire/Bushfires | Fire may be a risk in peri-urban or regional sites adjoining bushland or grassy fields. Extra caution is needed on high fire danger rating days. |
| Weather events | Key dangers to be aware of are lightning, strong winds, rain and hail. |
| Cold weather | Long term exposure to very low temperatures could lead to hypothermia – a condition where the body's temperature drops below 35$^{o}$C. Hypothermia can be fatal. |
| Sun exposure | A risk for virtually all sites, sun exposure is important to manage to avoid heat exhaustion and sunburn. |
| Moving vehicles/traffic | Any street, roads, highways or driveways should be treated with great caution. There is a risk of being hit by vehicles or cyclists which could result in serious injury or death. |
| Pedestrians and cyclists | Footpaths and tracks are a key sign to be aware of pedestrians and cyclists. A collision between you and a pedestrian or cyclist could result in injury. |
| Falling objects | This might be a risk when surveying areas with overhanging trees. Coconut-bearing trees in the tropics are worth particular consideration. |
| Water/flood risks | Potentially an issue at sites adjoining creeks, rivers, beaches, or in other areas during periods of extreme rain such as during the wet season in northern areas. |
| Dangerous animals | Snakes, spiders and other dangerous venomous animals pose a risk at a variety of sites, particularly main road and park and beaches. Dogs, mosquitos, sandflies, ticks, crocodiles and swooping birds are also hazards to be mindful of. |
| Physical violence or verbal abuse | This could be an issue at any site, but particularly public areas where people might under the influence of drugs or alcohol. |

| | |
|---|---|
| Needles, syringes, sharp objects | Sharp objects in transect areas being audited could cause cut and puncture wounds with risk of disease or infection. |
| Virus infection & transmission | Viruses such as influenza and COVID-19 pose a risk to your health and those around you. |
| Fuel/chemicals | Fuel or chemical in containers or in a spill event creates a hazardous environment that could result in burns to the skin, damage to eyes, respiratory system or an explosion. |
| Asbestos | If inhaled, asbestos fibres can result in a long-term serious rehabilitating illness or death. |

**Site Type Assessment Checklist**

# Site Type Assessment Checklist

## RESIDENTIAL AREA

| | |
|---|---|
| **Summary** | A street/collection of streets in a residential area. The street has homes, units, or apartments on both sides of the street. |
| **Inclusion criteria** | ☐ Houses, multi-unit developments, apartments and townhouses on both sides of the street. |
| **Exclusion criteria** | ☐ Streets maximum speed limits greater than 60 km/h.<br>☐ Dead end/blind-ended streets (e.g. courts, cul-de-sac)<br>☐ Streets with schools or other significant public amenity (though these can be nearby in neighbouring streets). |

## RETAIL AREA

| | |
|---|---|
| **Summary** | A street/collection of streets within a retail precinct (i.e. shopfronts). |
| **Inclusion criteria** | ☐ Majority of street contains retail shops and food stores. A small fraction of other building types (e.g. a library, a small office frontage) is allowed. The retail strip might be only on one side of the road or both. Buildings that have retail fronts/at ground level and residential above can be included. |
| **Exclusion criteria** | ☐ A strip that is dominated by restaurants/pubs (i.e. more than 80% of the land use areas). |

## INDUSTRIAL AREA

| | |
|---|---|
| **Summary** | A street/collection of streets in an industrial area. |
| **Inclusion criteria** | ☐ Streets will include factories, industrial offices, warehouses, workshops or other industrial buildings. |
| **Exclusion criteria** | ☐ Industrial areas that are accessed by a private road. e.g. Industrial parks where the listed address is the main road at the front of the estate.<br>☐ More than 10% of the street length contains retail shops. |

## RECREATIONAL PARK

| | |
|---|---|
| **Summary** | A public outdoor space frequently visited by individuals and families for recreation and leisure. |
| **Inclusion criteria** | ☐ Has **one or more** of the following: a playground or covered eating area (e.g. a rotunda) or barbeque or similar substantial piece of infrastructure.<br>☐ 50% or more open area (i.e. grass, paths) that is not playgrounds or dense vegetation. |
| **Exclusion criteria** | ☐ Parks with food retail outlets (kiosks, takeaway stores etc.) within the site or within 50 m of the park boundary. |

## BEACH

| | |
|---|---|
| **Summary** | A mostly sandy beach frequently visited by people for activities such as swimming, walking, other recreation and relaxation. |
| **Inclusion criteria** | ☐ The majority (i.e. 90% or more) of the beach area to be sampled is sand (or sand covered in seaweed etc.). |
| **Exclusion criteria** | ☐ Piers, jetties, wharves or boat ramps are within 100 metres of the location of the transects to be surveyed. |

## MAIN ROAD

| | |
|---|---|
| **Summary** | Straight open stretches of sealed road with wide verges. Roads that typically act as an arterial for traffic between and around population centres. |
| **Inclusion criteria** | ☐ A main road linking population centres (towns/cities)<br><br>☐ Vegetation bordering each side of the road |
| **Exclusion criteria** | ☐ Petrol stations, fast food outlets and service centres within 2 km of the site<br><br>☐ Site has bridges, overpasses, rest stops, turn-offs, intersections (except driveways), and slipways<br><br>☐ Areas with steeply sloped verges (i.e. $>45^0$) are excluded. |

**Site steps checklist**

This checklist provides a quick reference to remind you of the steps to complete at each site.

# Steps to complete at every site

1. Site safety assessment
2. Site type assessment
3. Collect site context data
4. Set up transect
5. Collect transect context data
6. Conduct litter count
7. Pack-up

## 8.4 Surveyor Skills

### Estimating area in square metres

You will be required to estimate the area of a transect that was not audited and record this area on the Transect Litter Count Form. The area is measured in square metres ($m^2$). You need to know the approximate length and width of each area of the transect that was not audited.

For small areas, you can use your litter poking stick as a guide to estimate the width and length – noting the stick is 1.5 m in length with a mark or tape made at 1 m. For medium sized areas, you could run your retractable measuring tape out over the area in both directions to capture length and width.

For circular, oval or odd-shaped areas, use your judgement to approximate the area by imposing one or more square or rectangular shapes on top of the area and noting the length(s) and width(s)

The length and width measured in metres are multiplied together to obtain the number of square metres.

*Estimated number of square metres = Length x Width*

## Estimating the volume of illegal dumping

If there is illegal dumping at a site to be audited, you are required to estimate the volume of illegal dumping present. Examples below will help you decide which of the three illegal dumping size categories to select:

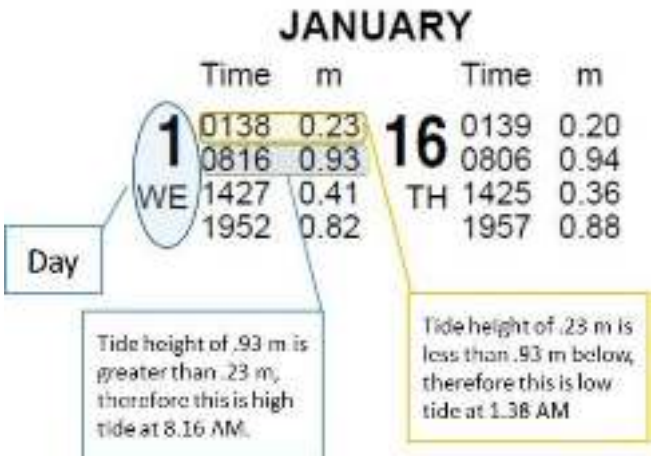
| Size | Description [19] |
|---|---|
| Small | About 1 wheelbarrow full / 1 or 2 garbage bags. A discarded shopping trolley would also fit into the 'small' category'.   |
| Medium | About one utility vehicle (ute) tray   |
| Large | One or more truck loads  |

[19] All images sourced from the Sustainability Victoria's Local Litter Measurement Toolkit - Photographic Index (first version, 2012), no longer available online.

## Looking up tide tables

When planning the audit of beach sites, you should look up the tide tables to identify the low tide times and plan your auditing of the beach to two hours before or after low tide.

You can access the tide tables for your site from the Bureau of Meteorology Tide tables webpage.[20] From the webpage, select your state/territory and then the closet town/city for the appropriate year. The tables show both the times and heights of low and high tide for each day of the year. There are two high and two low tides each day. First find the day of the planned beach audit, then inspect the height to identify if the time is a low or high tide. Times are shown in a 24-hour format.




[20] Bureau of Meteorology Tide tables: http://www.bom.gov.au/oceanography/projects/ntc/tide_tables.shtml

## Completing the Site Information Form

Table 9 below provides details on how to respond to each of the fields on the Site Information form. Whilst many fields are self-explanatory, it is important to read and follow the information in this table to ensure you apply the same rules and guidelines as other surveyors when making judgements about specific site characteristics.

**SITE DETAILS – Enter at the start before auditing the site.**

Table 9. Site Form field guidance.

| Site Form information field | Details |
|---|---|
| **SITE DETAILS** | |
| Audit date | Date of the audit. |
| Arrival time | Approximate time you arrived at the site. |
| Surveyor 1 & 2name | Names of surveyors. |
| No. additional surveyors | If there are more than two surveyors at the site include the additional number. |
| Site ID | Unique identifier for each site in a jurisdiction. You will find the Site ID for the current site in the Site List spreadsheet. |
| Site name | Meaningful site name copied from the Site List spreadsheet. |
| Site address | Physical Street address of site. Copied from Site List spreadsheet or automatically populated if using electronic data entry in the field. |
| Site type: | Select the site type. Included to provide clarity for the site type assessment. |
| Site type assessment | Store the result of the Site Type Assessment: pass or fail.<br><br>If the site fails the Site Type Assessment, then the site should not be surveyed and the Site Notes section of the Site Form (or Site Audit End electronic form) can be updated with details explaining why the site failed the assessment. |
| No. people at site: | Number of people visible at one point in time just before or during the time of the survey.<br><br>**Parks & beaches:** Observation taken from the park or beach entry point. Estimate the number of people across a clearly visible area of the site that is approximately 50 m x 100 m in size. If the beach is extremely populated, count the number of people in a smaller area such 10 m x 20 m and multiple this number by 5 to obtain an estimate for a 50 m x 100 m area.<br><br>**Residential, retail, industrial:** This is an estimated count made from the footpath location that is closest to the first transect GPS start point. On the footpath surveyors should face the street and turn right. Estimate the number of people you see in the first 50m of |

| Site Form information field | Details |
|---|---|
| | street. If your view is blocked within the 50m or the street changes from retail/residential/commercial to some other type of site, before 50m, then turn around and face the other direction and make your estimate.<br><br>If there are hundreds of people on the street and numbers are difficult to count, then walk to the kerb and mark out a 5 m length with chalk marks at each end. Estimate how many people are within the 5 m length of the street at one point in time. Multiple that by 10 to obtain an estimate for a full 50 m length of street.<br><br>**Main road:** Not Applicable. |
| Visibility: | Rain, smog, fog, low light conditions or smoke may limit surveyor ability to correctly survey litter. Litter survey work should only occur when weather and environmental conditions allow you to see clearly. Select the pass or fail checkbox to indicate if you can clearly see approximately 50 m into the distance.<br><br>• Pass - Clearly see 50 m or more into the distance<br>• Fail – **Can not** clearly see 50 m into the distance.<br><br>If visibility is poor and the site fails the visibility test, then surveying should stop and surveyors should either a) wait for conditions to improve; or b) report the situation to the supervisor and move onto the next site if visibility is likely to be better there. The site can be surveyed at a later date or time when conditions have improved. |
| Litter will be picked up | This is not a valid option for the sites being audited as part of the official litter monitoring program. For other groups and sites, this box can be selected to indicate that litter will be picked up during or after the audit. |
| Site photo IDs: | If using the paper-based form to collect data, then surveyors will take photos of the general site location using a smartphone or digital camera. The photo image names should be captured on the form so the relevant images can be uploaded and associated with the site data. If using the Mobile Phone App, then photos can be taken using the App. |

**SITE CONTEXT– Enter after all transects have been audited.**

The remainder of the fields should be completed after all transects at the site have been surveyed.

| Site Form information field | Details |
|---|---|
| **SITE CONTEXT** | |
| Cleanliness Rating | Surveyor impression of the amount of litter at the general site location. This assessment should be made after all transects have been surveyed. Making this assessment at the end allows the surveyor to walk around the general site area whilst surveying the different transects that might be spread out across a site or over many streets in the case of residential, retail and industrial sites. The assessment is not just of the transects, but the general site area. A set of photos has been created to provide guidance on what each cleanliness rating category looks like. |
| AusLM cleanliness rating photo index<br>  <br> | |
| Graffiti present | Indicates the presence of obvious graffiti at the site on infrastructure (bins, BBQs), roads and footpaths.<br><br>A thorough scan of a site is not required to identify graffiti. |
| Recent activities: Evidence site has been cleaned | Examples of evidence that sites have been cleaned for different site types is presented below.<br><br>**Beaches:** A series of parallel rake lines or in the sand may indicate a beach cleaner has recently been at the site.<br><br>**Parks and main roads**<br><br>For Parks and Main roads, contractors often remove litter from grassed areas before mowing. If there has been recent mowing and there is an absence of smaller shredded items, then this **may** be an indicator that the site was cleared before mowing.<br><br>**Parks**<br><br>Fresh tyre tracks leading to bins that are empty or nearly empty is another possible sign that a park may have been recently cleaned. |

| Site Form information field | Details |
|---|---|
| | **Retail/residential/industrial Streets**<br><br>Street sweeper or litter cleaning crews seen at the site. |
| Recent activities: Public event | Public events refer to organised public gathering involving approximately 100 or more people. A well-managed public event may also include a post-event clean-up activity that may explain the absence of litter at the site.<br><br>Look for the presence of promotional flyers and banners around the site. High numbers of specific litter items related to public events such as sports gels or event programs may also be evidence of a recent public event. |
| Recent activities: Storm/flood | Observable by erosion, washed out areas, areas under water, high concentrations of litter at the entrance to storm water drains, fallen trees or high amounts of debris blown across the site.<br><br>*Image: Fallen tree and containers concentrated around stormwater entrance.*<br><br>   |
| Recent activities: Strong wind | Signs of recent strong wind include a site that is mostly free of litter with the exception of high build-up of litter along one boundary or catchpoints in one side/corner of the site.<br><br>  |

| Site Form information field | Details |
|---|---|
| | Fallen trees and tree debris on the ground may also be a sign of strong wind. (See image in Storm/flood above) |
| Recent activities: Kerbside bin collection | Select if the majority of households at residential sites have their bin left out on the kerb and the **bins are empty**. This is an indication that bins have recently been emptied and this can explain higher litter loads on residential streets due to spillage and tipped bins. |
| Recent activities: Other | Select if evidence of any other activities not listed that may impact litter count. Document the activity or reason in the Site Notes field. |
| Grass: Recently mown | Indicate if there is evidence the grass has been recently mown. Recently refers to approximately the past 5 days<br><br>Evidence would include observable fresh cut grass is present at the site. The length of the grass may indicate it has been cut. Tractor or mower tyre tracks may also be indicators that the site has been mown. High volumes of freshly shredded plastic and paper may also be an indicator of recent mowing.<br><br>**For parks**, the grass would normally be cut to a short height.<br><br>**For main road roadsides**, grass may be cut to a short to medium height. |
| What is nearby: Fast food restaurants | **Parks & beaches**<br><br>Nearby is defined as with visible distance from the general site boundaries. For example, 50 m from the **main** entry to a beach or 50 m from the boundaries of a park. Surveyors are not expected to walk around the entire site boundary to find if the fast-food restaurant is nearby.<br><br>**Residential, retail and industrial**<br><br>After auditing all transects for the site, mark if any fast-food restaurants were observed.<br><br>**Main road**<br><br>N/A. Main roads with fast food or convenience stores within 2 km distance from the site are excluded. |
| What is nearby: Convenience stores nearby | As above for fast-food restaurants but focusing on convenience stores. |
| What is nearby: Construction site nearby | As above for fast-food restaurants but focusing on construction sites.<br><br>**Main road**<br><br>After surveying all transects for the site, mark if any construction sites were observed on adjacent land. |

| Site Form information field | Details |
|---|---|
| What is nearby: Public building | As per Construction Sites above, but focused on the presence of schools, churches, libraries, hospitals, aged-care facilities or other public buildings. |
| What is nearby: Public transport stop | As above, focusing on public transport (train, tram, bus) stops, transit hubs or stations. |
| Bins present (by type) | **Beach and Park:** Mark if bins are present within 50m from the main beach and park entry point.<br><br>Bins may be present on main roads at truck-stops/rest areas. These areas would be 'exclusion' criteria for a site.<br><br>For residential, retail and industrial sites, the presence of bins within transects will be captured on the Transect Information form. There is no requirement to note the presence of bins as this will be difficult for these non-open areas site types. |
| BBQs present | **Parks**<br><br>Mark if BBQ facilities are observed at the site |
| Bin overflowing | Note any of the bins observed above are overflowing with litter protruding from the bin entrance or already fallen out of the full bin. |
| Illegal dumping present | Indicate if illegal dumping is present at the site.<br><br>**Beach & park:** Look for dumping within 50m from the beach and park entry point. If illegal dumping is found whilst auditing the transects, then this can also be included in the assessment. Dumping often occurs next to bins.<br><br>Select the 'no' checkbox if no illegal dumping was found. If illegal dumping is present, then assess how much is present according to the following categories:<br><br>• Small - About 1 wheelbarrow or 1 or 2 garbage bags full<br>• Medium - About one utility vehicle (ute) tray<br>• Large - Truck load<br><br>See Section 0 for guidance on estimating the scale of illegal dumping. |
| Age of litter at site | After counting all the litter in all transects for the site, determine if most of the litter counted during the audit was:<br><br>• New<br>• Equal amounts of new and old<br>• Old<br>• Unsure<br><br>The assessment can be informed by: |

| Site Form information field | Details |
|---|---|
| | • how clean litter items are, where clean litter items are likely to be new and dirty items (such as covered with grass, dust/dirt) are likely to be old.<br>• how clear or faded litter item packaging is, where bright, vibrant labels are likely to be new and faded labels are likely to be old.<br>• how decomposed fruit scraps are, where whole and fresh-looking fruit/fruit scraps are likely to be new |
| Significant hazard | Indicate if there were any significant hazards or hazardous litter items found at the site. Examples would include needles/syringes, sharp knives, jagged broken glass, asbestos.<br><br>Other hazards at the site can also be noted if they were not already listed in the Site Details. For example, bluebottle jellyfish found on the beach.<br><br>Describe the hazard in the Site Notes. |
| Departure Time: | Capture the time the survey team leave the site after all audits are complete. |
| Site Notes | Record any useful site notes. These may include:<br><br>• Updated parking instructions<br>• Any major new developments at or around the site to keep an eye on. For example, large adjacent areas being demolished.<br>• Any other factors not included in the Site Form that might have influenced the litter audit or the presence of litter at the site.<br>• Details of any hazard |

## Completing the AusLM Transect Information form

Table 10 below provides details on how to respond to each of the fields on the AusLM Transect Information form. Whilst many fields are self-explanatory, it is important to read and follow the information in this table to ensure you apply the same rules and guidelines as other surveyors when making judgements about specific transect characteristics.

Table 10. Transect Litter Count Form field guidance.

| Litter Count Form information field | Details |
|---|---|
| **General details at top of form** | |
| Audit date | Date of the audit |
| Start time | The time the litter count started at the transect |
| Site ID | Unique identifier for each site in a jurisdiction. You will find the Site ID for the current site in the Site List spreadsheet or the related Site Information form. |
| Transect # | The Transect number being audited at the site. Each transect has a number between 1 and 6 assigned to it for the common site types.<br><br>The transect number can be found by either referring to the:<br><br>• Satellite map of the site that shows the location of the transects<br>• Transect number from the Sites List spreadsheet |
| Site Name: | Meaningful site name copied from the Site List spreadsheet or related Site Information form. |
| **Transect location details** | |
| Starting GPS location: Lat, long, GPS accuracy | Capture GPS coordinates at the start of the transect. With the exception of beach sites, this only needs to be done the first time a transect is surveyed.<br><br>**If using the FieldTask** mobile phone App – Tap on the 'Start GeoPoint' button to record your location. By default, coordinates are recorded once accuracy reaches 3 metres. If it is taking too long to get this degree of accuracy, you can click the 'Save GeoPoint' button and enter the accuracy displayed when you pressed the button.<br><br>**If using Handy GPS,** open the APP and record your current location and accuracy.<br><br>Three pieces of information are required for each point:<br><br>• Latitude (in Decimal Degrees – record all 6 decimal places)<br>• Longitude (in Decimal Degrees – record all 6 decimal places)<br>• GPS accuracy (in metres) |

| | |
|---|---|
| | A free GPS APP such as Handy GPS on a phone can be used.[21] |
| Optional compass bearing from start to end point (beach/park only): | A compass bearing can be used to point in the direction of the end point from the start point at park and beach transects. During the initial transect audit the compass bearing can be entered here. |
| Transect width is mostly constant | **Beaches, Parks and Main roads**<br><br>Transects have a fixed width. You should select 'Yes'.<br><br>**Retail/residential/industrial Streets**<br><br>  <br><br>Transect may have a fairly constant width, or it might be highly variable. For example, if the transect spans a corner, the two streets may have different transect widths. In this case you would select 'No' for this option. An example of this is presented on the right where the two streets that form the transect have different widths (4m and 2m).<br><br>In AusLM, a mostly constant transect width is one where the average width can be estimated by measuring the transect width at the start and end of the transect. If there is a fairly uniform/straight transect edge, but the start and end widths vary by +/- 1 m or less, then we can still say the width is fairly constant. If the difference between the start and end width is greater than 1 m, then it safer to mark the transect is not mostly constant – See image below.<br><br>  <br><br>The transect width at Angel Street is not exactly constant, however, if the distance across the transect above was 100 metres, then 1 metre difference in width is not high and you could select 'Yes' the width is fairly constant. If the difference was greater than 1 metre, then it would be safer option to select 'No'.<br><br>If you select 'No', then update the Transect Notes with a brief explanation why you made that decision. Answering 'No' will trigger a process where the area of the transect is calculated with the aid of satellite images, your explanation, the photos you take and start and end widths you measure. |

[21] Play store url: https://play.google.com/store/apps/details?id=binaryearth.handygpsfree&hl=en&gl=US
Apple App Store: https://apps.apple.com/au/app/handy-gps/id704471940

| | |
|---|---|
| Transect start width | Measures the actual width at the **start of the transect**.<br><br>**Beaches, Parks and Main roads**<br><br>These transects have a fixed width. Parks: 3 m. Beach: 6m and Main road: 3 m.<br><br>**Retail/residential/industrial Streets**<br><br>Use the builders tape measure to measure and record the width of the transect at the start of the transect.<br><br>**Residential -** measure from the edge of the gutter in the street, to the property boundary (typically delineated by a fence or mailbox).<br><br>**Retail** –measure from the edge of the gutter in the street to the shopfront<br><br>**Industrial** - measure from the edge of the gutter in the street, to the property boundary (typically delineated by a fence). |
| Transect length | **Retail/residential/industrial Streets & Main roads**<br><br>Transects for these site types have a fixed length of 100 m.<br><br>**Parks**<br><br>The length of each transects at park sites is different and varies between sites. The length of park transects will be calculated based on satellite images and GPS coordinates. You do not need to measure the distance.<br><br>**Beaches**<br><br>The length of each transect at beach sites is different and the length will likely vary between each visit to the site as it is impacted by the tide. Following the “Laying out the transect and counting litter’ instructions, you should measure the transect length between the transect start and end points. Although the transect extends 2 m into the dunes/vegetation at the rear of the site, past the tape measure, this is not included in the transect length and, instead, is added on in the data analysis process. |
| Tran. start photo ID | **If using the paper-based form**, then surveyors will take photos of the:<br><br>• transect start point (this only needs to be done the first time a transect is audited)<br>• from the start point looking towards the end of the transect. This photo is taken every time and forms evidence of the audit.<br><br>A smartphone or digital camera can be used and the photo image names (or date/time) should be captured on the paper form so the relevant images can be uploaded and associated with the site data.<br><br>**If using the FieldTask App**, photos are taken using the App and there is no need to write down image IDs. The actual start point can be marked with a cross or circle using the ‘Markup Image’ button. |
| Transect Includes | After conducting the litter count within a transect, note if any of the following items were in the transect: |

| | |
|---|---|
| | • BBQ area<br>• Tables/chairs/ benches/seating<br>• Mow line (shorter grass as a result of mowing borders tall grass and this creates a place where litter is trapped against the taller grass)<br>  <br>• Fence / temporary fence<br>• Playground<br>• Bins<br>• Ditch or drain<br>• Garden beds<br>• Raised planter boxes<br>• Public transport stop/transit centre<br>• Hard rubbish. Hard rubbish is a collection or pile of items that have been deliberately placed on the nature strip for collection by council. It should be labelled for Council pick-up or follow protocols relevant to the Council to indicate that it is hard rubbish. It is different to illegal dumping which is discussed later in this table. |
| Grass length | Note the length of the grass. The grass length will likely vary across the transect. Try to provide an approximate average of the length visible from the start of the transect. Select the most appropriate length from the following categories:<br><br>• Short (0 - 9 cm)<br>• Medium (10 - 19 cm)<br>• Long (20+ cm)<br>• N/A – Select if there is no grass within the transect. |
| Visual estimating used | When there are very high concentrations of cigarette butts in a small area of the transect, surveyors may elect to use the visual estimation technique outlined in Section 0.<br>Select the 'Cigarette butts were estimated' checkbox if visual estimation was used for cigarette butts.<br><br>If cigarette buttes were not estimated, then there is no need to mark any boxes. |
| Sub-sampling used | If there are very high numbers of litter items across the entire transect, then surveyors may choose to sub-sample litter across the entire transect as per |

| | |
|---|---|
| | instructions in section 0 of the Field Guide. Mark this checkbox if sub-sampling was used. |
| Illegal dumping present | Indicate if illegal dumping was found within the transect areas. Dumping often occurs next to bins.<br><br>Do not count a clearly labelled pile of hard rubbish that has been left on the nature trip for collection by council or a service provider.<br><br>Select the 'no' checkbox if no illegal dumping was found. If illegal dumping is present, then assess how much is present according to the following categories:<br><br>• Small - About 1 wheelbarrow or 1 or 2 garbage bags full<br>• Medium - About one utility vehicle (ute) tray<br>• Large - Truck load<br><br>See Section 0 for guidance on estimating the scale of illegal dumping. |
| Transect end width | Take a measurement of the width at the end of the transect. See 'Transect start width' above for more details. |
| End GPS location | Capture GPS coordinates at the end of the transect. This only needs to be done the first time a transect is surveyed, except for beaches where it must be taken every time (as the end point is dependent on the tide and wave action). See 'Starting GPS location' above for more details. |
| Tran. end photo ID | **If using the paper-based form**, then surveyors will take photos of the:<br><br>• transect end point (this only needs to be done the first time a transect is audited)<br>• from the end point looking towards the start of the transect<br><br>A smartphone or digital camera can be used and the photo image names should be captured on the paper form so the relevant images can be uploaded and associated with the site data.<br><br>**If using the FieldTask App**, photos are taken using the App and there is no need to write down image IDs. The actual end point can be marked with a cross or circle using the 'Markup Image' button. |
| Transect Notes: | Record notes about the transect that might explain the presence or absence of litter. |
| End Time: | Capture the time the transect audit finished. |
| 2 m into dunes/rear vegetation surveyed | **Beaches only**<br><br>Record if the 2-metre area at the rear of the beach behind the measured transect start point was surveyed. |
| Engineered structure at rear of beach: | **Beaches only**<br><br>Record if there is a physical engineered barrier such as a boardwalk or sea wall at the rear of the beach behind the measured transect start point. |

| | |
|---|---|
| Litter count form photos | Capture a photo of the front and back sides of the litter count form. This is useful for record keeping purposes and is most useful when site and transect context data is captured directly on a mobile device whilst in the field. It may be more efficient to enter data captured on Transect Litter Count forms at a later time to reduce time spent in the field. |

# 9 Electronic data entry

This annex will provide the foundations and basic information you need to capture data directly using either a mobile phone/Tablet App called FieldTask or webforms supported by a web browser using the SMAP platform.[22]

The same knowledge will support the electronic entry or data captured on paper forms.

## 9.1 Preparation

Surveyors wanting to use a mobile phone/tablet App should follow the instructions below to install the required software on their device.

**Android device users**

Download and install the FieldTask App[23] from the GooglePlay store. Download and install the Handy GPS (free) App[24] from the GooglePlay store.

**iPhone device users**

Download and install the Handy GPS (free) App[25] from Apple App Store. The FieldTask App is not compatible with iPhone devices. iPhone users can use webforms to conveniently collect most (but not all) data required. If not already installed, download and install the Chrome browser App[26] from Apple App Store. You should use this when adding data using SMAP webforms as it is the browser that is more compatible with SMAP webform features.

**All users**

Turn on Location Services on so you can use Maps and GPS tracking. Open the Handy GPS App and update the GPS coordinates format - on App home screen, change UTM to Lat Lon (Deg) to set to the GPS coordinates format to Decimal Degrees.

## 9.2 Foundation data setup

To implement the AusLM in an effective and efficient manner, there are a number of foundation data entry tasks that need to be completed. These tasks should be completed by the AusLM management team.

| Data setup task | Description |
|---|---|
| SMAP user account creation | Before surveyors can use the FieldTask or SMAP webforms, they must have a user account on SMAP and be given Enumerator access for basic data entry access, or Analyst access for the ability to add and edit data. |
| Entering Surveyors | Each surveyor participating in field work to audit sites should be added to the Surveyors forms in SMAP so they show up in the relevant drop-down lists in the Site Information Start form. |

[22] SMAP website: https://sg.smap.com.au/
[23] FieldTask App: https://play.google.com/store/apps/details?id=org.smap.smapTask.android
[24] Handy GPS (Free) App on Android: https://play.google.com/store/apps/details?id=binaryearth.handygpsfree
[25] Handy GPS (Free) App on Apple App store: https://apps.apple.com/au/app/handy-gps/id704471940
[26] Google Chrome on Apple App store: https://apps.apple.com/au/app/google-chrome/id535886823

| | |
|---|---|
| Entering Locations | A location is either a city, town or a local government area within a city. Completing a Location form entry in SMAP is a precursor to entering a Site Definition entry. If you want to be able to select sites via a dropdown list in the Site Information Start & End forms, then you must first add the Location for the site(s). |
| Entering Site Definitions | If you want to be able to select sites via a dropdown list in the Site Information Start & End forms, then you must first add a Site Definition entry. The Site Definition form asks you to enter in basic details about the site. Based on the data entered, a unique Site ID will be created. Other key data stored includes things such as the site address, GPS location of the site, parking notes and general site notes. If all the transect start and end GPS points are entered, then links to these start and end points can be displayed within the data entry forms (or retrieved via the dedicated Site Finder form) to help surveyors navigate to the start and end locations. |

Surveyors are not expected to complete the above setup tasks. A supervisor or manager should be able to assist with this process.

## 9.3 Electronic forms summary

The following electronic forms are available to speed up data collection and entry in the field.

| Electronic form | Description |
|---|---|
| Site Finder | Helps surveyors find and navigate to a site or transect start and end points. |
| Site Information Start | Site details captured upon arrival at the site. The data captured matches the first part of the Site Information paper form. |
| Site Information End | Site details captured after all transects have been audited. The data captured matches the second part of the Site Information paper form. |
| Transect Information Start | Details captured at the start of the transect, including GPS coordinates and photos. The data captured matches the start of the Transect Information paper form. |
| Transect Information End | Details captured at the end, or after auditing the transect, including GPS coordinates and photos and transect context data. The data captured matches the latter half of the Transect Information paper form. |
| Transect Litter Count form | Used to capture the litter count totals for each litter item category. The form has been designed to support the entry of data captured on the Transect Litter Count paper form. Whilst it is possible to |

capture this data using the electronic form whilst auditing a transect, we do not recommend this approach.

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All electronic forms are available in two versions:

1. **FieldTask forms -** FieldTask is a Mobile phone (tablet) data collect App for Android. FieldTask is not available on iPhone devices.
2. **SMAP webforms** - forms can be accessed through a web browser using Google Chrome. This option does not allow advanced functionality, such as directly taking a photo and capturing GPS coordinates.
   Surveyors using the Webform will need to take a photo using their phone camera and then upload the image/s taken via the photo field in the WebForm. To capture GPS coordinates, surveyors using WebForm can use Handy GPS App to get GPS coordinates and then enter these coordinates into the alternative GPS coordinate fields on the SMAP forms.

## 9.4 Collecting data in the field using FieldTask

Android phone users can capture data directly into the SMAP database using the FieldTask App. The following steps provide a simple overview of the order of events:

1. Use Site Finder form to help navigate to the site and find a carpark. The form does not need to be saved or submitted.
2. Once at the site, complete the Site Information Start form to collect some initial site details and confirm if the site passes or fails the Site Type Assessment. Save and submit the form once completed.
3. Complete the Transect Information Start form. This form serves a few different functions, including helping the surveyor navigate to the start of the transect and prompting collection of photos, GPS coordinates and some context information at the start location.[27] Save and submit the form once completed.
4. Surveyor now completes the litter count uses the paper Transect Litter Count Form.
5. Complete the Transect Information End form. This form serves a few different functions, including helping the surveyor navigate to the end of the transect (this form can be opened before starting the litter count) and prompting collection of photos, GPS coordinates and some context information at the end location. Save and submit the form once completed.
6. Once all transects at a site are audited, complete the Site Information End form to collect additional site details. Save and submit the form once completed.
7. Now, or at a later time, complete the electronic version of the Transect Litter Count form to enter data captured using the paper version of this form.

## 9.5 Collecting data using paper forms and entering data using SMAP webforms

If preferred, Site and Transect Information data can be collected on paper forms and entered into SMAP WebForms at a later time.

**High level steps for data collection:**

1. Navigate to your site using information from the Site List spreadsheet.
2. Once at the site, complete the SITE DETAILS section of the Site Information form. Take photos using a digital camera or mobile phone camera.
3. Use the site satellite image and Site List spreadsheet to identify and navigate to the transect start point location.
4. Complete the top and the START OF TRANSECT DETAILS section of the Transect Information form. If this is a beach site or it is the first time other sites are being audited, then GPS coordinates are captured by using the mobile phone App (Handy GPS). Coordinates are written on the paper form.
5. Use the site satellite image and Site List spreadsheet to identify the transect end point location and prepare to navigate towards the end point.
6. Complete the Transect Litter Count form whilst walking between the start and end of the transect. **Remember to fill in the Site ID and transect number at the top of the form.**
7. After the transect has been audited, complete the remainder of the Transect Information form. Take photos and GPS points as required.

[27] The Site Finder form also has the ability to help you navigate to the transect start and end points

8. After all transects for the site have been audited, retrieve the Site Information form and complete the remainder of the form.

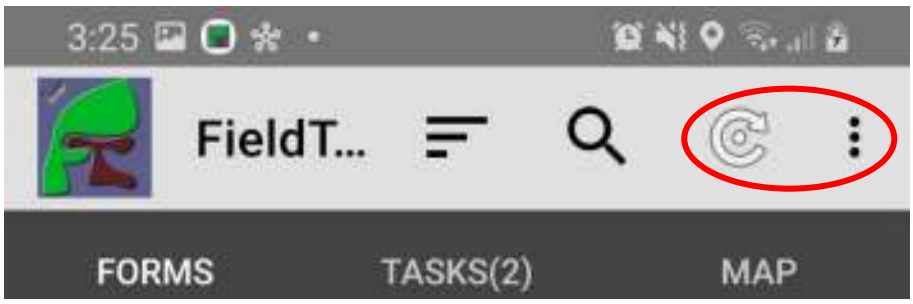
**Entry of paper forms into SMAP webforms.**

All paper forms are entered into SMAP using SMAP WebForms via sg.smap.com.au. The process is similar to section 9.4 Collecting data in the field using FieldTask above, however, users will need to manually enter GPS coordinates and manually upload photos taken with their camera.

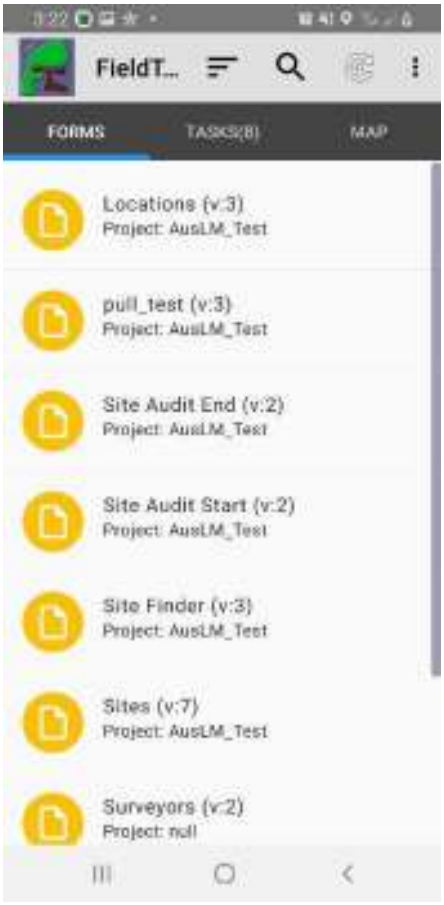
1. Refer to the paper Site Information form and complete the Site Information Start WebForm and Site Information End WebForm.
2. Refer to the paper Transect Information form and complete the Transect Information Start WebForm and Transect Information End WebForm.
3. Refer to the paper Transect Litter Count form and complete the Transect Litter Count WebForm.

## 9.6 FieldTask Setup

1. Open FieldTask App on phone.
2. Click the Three dots in the top right corner.




3. Select General Settings.
4. Select Server.
5. Enter URL as https://sg.smap.com.au
6. Enter Username as per that supplied. If details are not supplied, please contact your supervisor.
7. Enter Password as per that supplied.
8. Tap phone back/return arrow twice, to return to the initial screen.
9. Click the Three dots in the top right corner again.
10. Select Get Blank Form.
11. Select forms Site Information Start, Site Information End, Site Finder, Transect Information and Transect Litter Count, and click ‘Get selected’.
12. Afterwards, click the Refresh icon next to the three dots in the top right-hand corner
13. All forms should now be visible under the Forms tab.



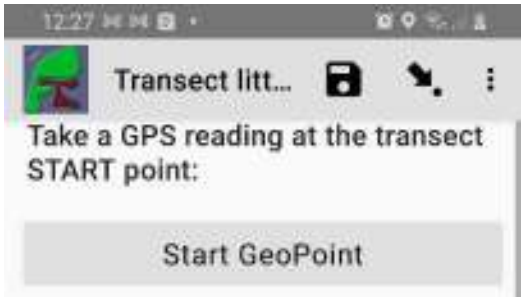
## 9.7 FieldTask Basics

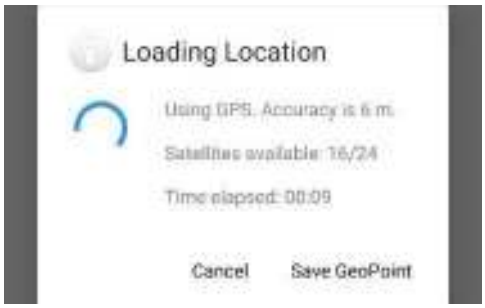
To complete a new form, tap on the Forms menu and then tap on the form that you would like to complete.

Within each form, use your finger to scroll up or down through the fields on the page. Swipe from right to left to advance to the next set of questions. If you want to go back to a previous set of questions, then swipe from Right to left across the screen.

When prompted you can easily take a photo by tapping the 'Take Picture' button. After taking the photo you can tap 'Markup Image' to place a cross or circle on the transect start/end points.


When prompted you can record GPS coordinate by clicking the 'Start GeoPoint' button. By default, the GPS position is recorded once the accuracy reaches 3 m (unless customised in the SMAP form design). If after 1 minute you are still waiting for SMAP to capture the coordinates, then you can click the 'Save GeoPoint' button and make note of the accuracy and write this down on the form.

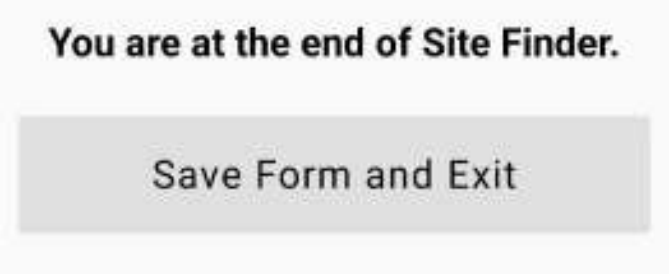



If you press the back button on the phone you will be prompted to save or ignore changes. Saving creates a work in progress version of the form that you can find and return to for further editing. If you want to edit a form that has been 'saved', follow these steps:

1. Navigate to the Tasks menu in FieldTask.
2. Locate the form entry that requires editing - it should be blue in colour.
3. Tap the form to continue editing.

At the end of the form, the following image will be displayed.




Tap 'Save Form and Exit'. One you have tapped this button, the form can no longer be edited. The form is ready for uploading to the server.

**IMPORTANT – Don't forget to upload data to the SMAP server**

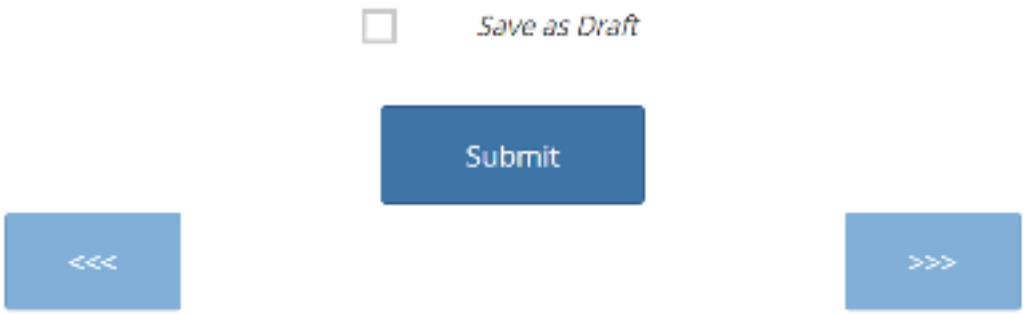
To upload saved forms to the SMAP server, click the refresh icon which is in the top right corner next to the three dots. After uploading the forms, the icon for the form will change to green colour and there will be a tick in the middle of a cloud.


The image below shows 3 forms in different stages. From top to bottom they are: Form successfully uploaded to the SMAP server; Form completed and saved (tapped 'Save Form and Exit' at the end of the form) and ready for uploading; Form saved,

## 9.8 SMAP WebForm basics

It is **strongly** advised to use Google Chrome Browser to ensure the best compatibility of SMAP functionality. To access SMAP Web forms:

1. Navigate to https://sg.smap.com.au
2. Login using your username and password.
3. Click the modules menu on at the top of the screen & select WebForms.
4. A list of WebForms should be displayed. Select the form you want to complete.
5. It is advised that you press the F5 key on your keyboard before entering any data. This will refresh the form and force it to pull in any other related data that has been entered. Pressing F5 is only required after adding a new Surveyor, Location, or Site Definition, or the first time you are accessing one of these forms.
6. Use the navigation buttons down the bottom of a form to move forwards and backwards through the form.
7. At the end of a form, click the submit button.




**To see if data has been entered:**

1. Click the Modules menu & select Analysis.
2. Click on the Table icon.
3. Click on the Survey dropdown list to select the survey form you want to see data for.
4. Click Save.
5. Look at the data in the table to confirm your entry is there. If there are many entries, you may need to move between different pages of data by clicking the arrows in the top left corner.


6. You can also search and filter data by date or other search criteria by clicking on the gear cog in the top right hand corner and setting your search criteria and clicking Save. The Advanced Filter, provides the greatest power for searching and clicking the (i) to the right of the filter provides some more information on how to search.
7. Click the red dash in the top right corner of the screen to minimise the window or click the Green plus to maximise a window.

**To edit an entry:**

1. Find the entry you want to edit
2. Click on the three horizontal lines on the far left hand side of that entry, then select 'Edit in web form' and click OK.
3. The form can now be modified.
4. Go to the end of the form and click the 'Submit' button to save your changes.

## 9.9 Additional SMAP training resources

Additional online help for SMAP can be found here: https://smap.com.au/docs/index.html

Additional SMAP and fieldtask training videos can be accessed here: https://www.youtube.com/user/ianaf4you/videos

# 10 Keeping COVIDSafe

**What is Coronavirus (COVID-19)?**

Coronavirus (COVID-19) is a virus that has affected many people in Australia and other countries. A virus is an illness or disease that can spread easily from one person to another person. COVID-19 can easily spread from one person to another person unless precautions are taken. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment, however, COVID-19 can be fatal or cause serious health issues. A COVIDSafe plan should be developed to help prevent the transmission of COVID-19 during AusLM-related activities.

**A summary of what you need to do.**

You are required to read the COVIDSafe plan in the AusLM toolkit. You must follow the actions in the plan to help keep you and those around you safe from COVID-19 infection and transmission. The COVIDSafe plan also documents what to do in the event of potential or suspected COVID-19 infection or transmission. A summary of key COVIDSafe measures that you are required to observe include:

- If required by regulations or recommended practices, wearing an appropriate face mask at all times when out in the field conducting litter audits or when within confined indoor spaces unless you have an exemption.
- Practice physical/social distancing with a spacing of 1.5 metres between individuals where possible.
- Practicing good hygiene such as handwashing with soap or sanitising hands with appropriate sanitiser before and after conducting a site audit.
- Sanitising commonly touched items and surfaces such as the AusLM toolkit items and vehicles used to travel to sites.

The COVIDSafe plan outlines these and other measures you need to follow when conducting AusLM auditing work.