

Department of Planning, Housing and Infrastructure

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Housing Supply Pipeline Audit: Technical Note

A step-by-step guide to preparing a Housing Supply Pipeline Audit

February 2024





Acknowledgement of Country

The Department of Planning, Housing and Infrastructure acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land, and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Glossary

Term	Definition
Development capacity	The theoretical capacity of land to develop, measured in dwellings or jobs.
Development ready land	Land that is zoned, serviced (water, power, roads) infrastructure enabled, constraints resolved, and bio-certified and environmental constraints resolved.
Effective dwelling demand	The market rate of dwelling uptake considering size, type and location of dwellings that people are willing and able to buy and rent. This may consider both the 'stated' housing preferences (through a survey for example) and 'revealed' preferences, being the types of homes people actually choose.
Enabled land	Land that is wholly or partially serviced by enabling infrastructure, enough to meet the demand for development take up
Gross residential density	Gross residential density includes residential uses, local roads plus local non-residential land uses such as parks and school, measured as number of dwellings divided by the area of land they occupy.
Implied dwelling demand	The theoretical 'need' or number of new homes required based on the projected number of households. The level of underlying demand is primarily driven by migration and demographic factors and is determined by the NSW Common Planning Assumptions
Housing supply pipeline	The classification and estimate of housing land as it passes through the planning process from non-residential to be made available for future residential development.
Net residential density	Net residential density is gross residential land minus local roads plus local non-residential land uses such as parks and schools, measured as number of dwellings divided by the area of land they occupy.
Strategic land	Land that is identified in a strategic plan such as a local housing strategy or regional plan
Years supply	The number of years it will take for a housing land to be consumed based on the assumed level of annual demand but does not include dwelling completion forecasts.

1 Introduction

This technical note provides guidance on how to undertake a Housing Supply Pipeline Audit (audit) to identify the extent and characteristics of housing land supply. Annual audits are a core deliverable for Urban Development Programs (UDPs) and the purpose of this technical note is to ensure that they are implemented using a consistent and repeatable method. Audits can also be undertaken outside of UDP areas to assess and monitor the adequacy of housing land supply in a given LGA or region.

This technical note provides a step-by-step guide for professionals undertaking an audit. It includes the following sections:

Chapter 1 outlines the purpose and context of the audit

Chapter 2 outlines which sites should be included in an audit and which site information should be captured

Chapter 3 outlines how planning status, infrastructure, environmental and biodiversity constraints, and housing potential are captured

Chapter 4 outlines how sites are categorised into stages in the housing supply pipeline

Chapter 5 outlines the requirements for data validation and forecasting

Chapter 6 outlines review and monitoring steps to ensure audit data remains current

Chapter 7 outlines how the insights from audits can be utilised as part of the UDP program and to support planning in general

Chapter 8 outlines data governance arrangements to ensure appropriate management of the large amount of data gathered through audits.

The note will be reviewed periodically as part of a broader UDP continuous improvement program and as needed.

1.1 Context

Audits of housing land supply are being implemented as part of the Urban Development Program to address information and data gaps and to better understand the housing land supply pipeline. Figure 1 outlines how the audits fit within the UDP framework and inform coordination and decision making.

Audits are intended to provide frequent, transparent, detailed, and accessible data on housing land supply, development activity, and constraints to housing delivery in order to:

- improve the quality and consistency of the evidence base used to inform planning and investment decisions
- improve coordination of planning, infrastructure, and development, and
- promote broader and earlier engagement with stakeholders and enable proactive interventions to address barriers to housing land delivery.

Audits will typically be undertaken annually and used to support the orderly development of housing lands in high population growth areas, where demand for housing is driving a need for more housing land to be development ready.



Figure 1 Urban Development Program framework

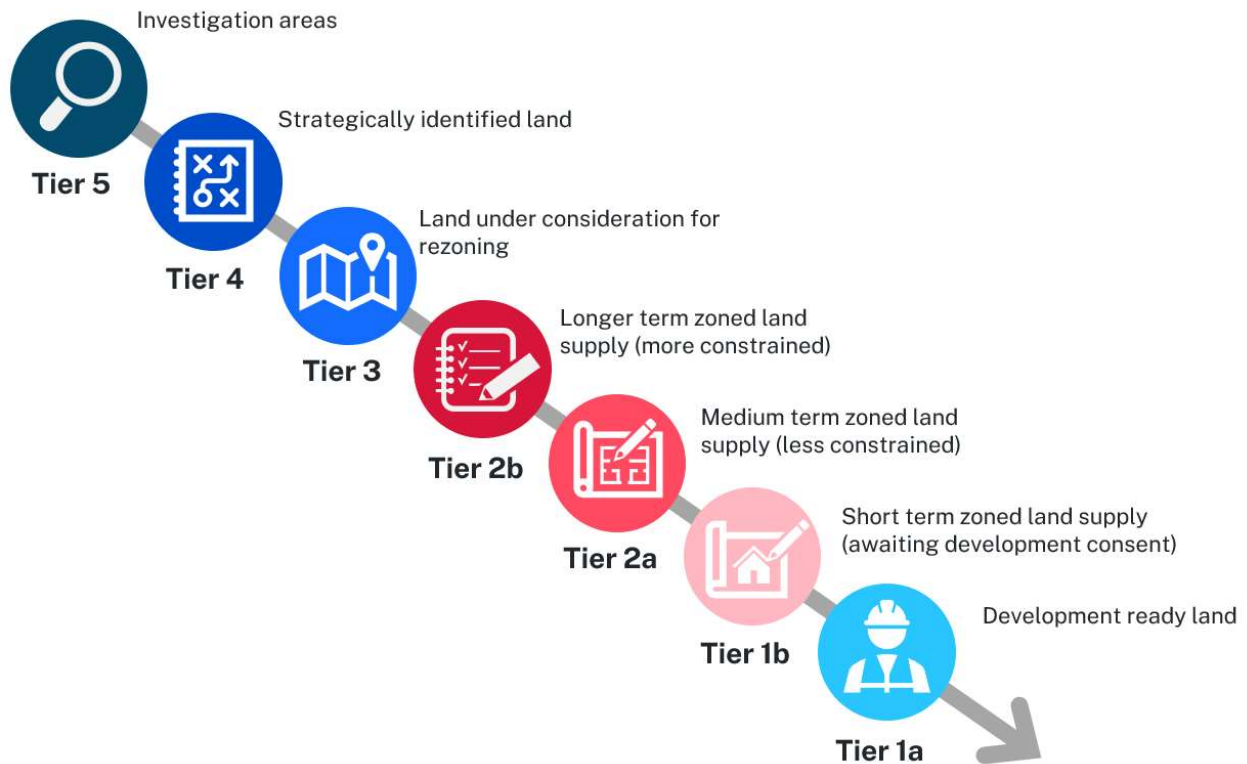
1.2 Purpose

The purpose of the audit is to record information on the current status of land that is identified for housing. The information captured as part of an audit allows housing land to be tracked as it progresses through the planning system, from initial strategic identification and investigations through detailed planning and infrastructure approvals to development.

Audits will not capture information about all factors that influence when and how planned housing land is developed, such as market feasibility, economic cycles, and materials and labour availability. Other analyses will need to be undertaken in addition to an audit to gain a full understanding of likely future housing supply.

Audit data can be used by a range of stakeholders, such as infrastructure and service providers, to align the sequencing of infrastructure with housing land development. Audits can also be used to identify issues that may require intervention to remove blockages to increase land supply in the housing supply pipeline or as the basis for identifying where further detailed investigations, studies or planning may be required.

The audit methodology creates a common framework so that audit outputs can be broadly comparable across different geographies. Performing HSPAs across UDP sites and more broadly in NSW will enable the development of geographic wide view of housing supply lands.



Estimated 10 to 15 years of zoned housing land supply, including development ready land, required at any given time

Figure 2 The Housing Supply Pipeline

1.3 Overview of the Housing Supply Pipeline Audit

The audit methodology provides a logical process to audit housing lands. The overall methodology should be undertaken in a sequenced manner as outlined in table 1 below.

Table 1 Audit Process Overview

Step	Purpose
1. Site identification	<p>The first step in the audit methodology is to define the areas which are being audited and capture core metadata for these sites.</p> <p>The focus is land that is zoned or otherwise identified for significant future housing development. This primarily includes 2 types of land:</p> <ul style="list-style-type: none">• Greenfield land• Major infill and urban renewal land, such as strategic centres, corridors, and precincts
2. Site analysis	<p>Sites identified for auditing are subject to desktop analysis and stakeholder engagement to capture best available information relating to:</p> <ul style="list-style-type: none">• Planning status• Environmental status• Biodiversity status• Infrastructure status• Housing capacity and supply
3. Site categorisation	<p>Following site analysis, land is categorised according to its status, and in view of any constraints and the likely timing for resolution of any outstanding matters.</p> <ul style="list-style-type: none">• Tier 5 – Investigation area• Tier 4 – Strategically identified land• Tier 3 – Land under consideration for rezoning• Tier 2b – Longer term zoned land supply (more constrained)• Tier 2a – Medium term zoned land supply (less constrained)• Tier 1b – Short term zoned land supply• Tier 1a – Development ready land
4. Validation and forecasting	<p>Validation of the audit findings provides stakeholders with a final opportunity to consider the accuracy of data and evidence and provide any final input.</p> <p>For sites approaching ‘development ready’ status landowners will be requested to provide a 5-year delivery forecast.</p>

Step	Purpose
5. Finalisation and reporting	Once data has been validated, the data, evidence and insights will be detailed as part of each UDPs annual Housing Land Monitoring Statement (HLMS). Once endorsed by the UDP committee, HLMSs will be published alongside online digital dashboards.

The audit is designed to bring together existing information which is typically known by those involved in project delivery (including planners, industry and/or infrastructure service providers) in a systematic and consistent format to generate insights and support decision-making.

The preliminary data for the purposes of completing the audit is expected to be collated through a review of information available in strategies, plans and the results of any investigations and technical studies that may have been carried out to date. Engagement with local and State government, development industry, and utility providers will also be required to access and verify the information required to complete an audit. Audits are intended to be completed using currently available data, however, detailed investigations into specific constraints and delivery issues may be undertaken following the audit to address any gaps in existing data where there is an identified need.

The following chapters provide a more detailed overview of each of these steps. Following this methodology will ensure that sufficient data is collected to track the progress of sites through the housing supply pipeline, helping to ensure that there is adequate housing land to support new development over the short-, medium- and long term.

1.4 Housing land database

A wealth of data, including geospatial data, will be collected as part of the audit process. Data collected will be stored in a central database and will need to be managed appropriately (refer to chapter 8). Auditors will be required to ensure data collected is quality assured and cleansed - for example ensuring there are no double entries, misspellings, etc.

At an individual site level, capturing detailed and site-specific information is important for identifying and resolving issues related to delivery at that site. However, if this is done in an ad-hoc way, the variance in ways data is captured and classified limits potential for broader analysis, and application.

Collecting data consistently unlocks the potential for site specific land audits to be aggregated to larger geographies – such as a township, LGA, Region, and State-wide level. Repeated overtime, it will provide valuable insights to housing land supply and enable creation of geospatial and time series analysis.

To help ensure that data collected in a standardised way, a spreadsheet with a common data schema and standardised entries has been prepared for use.

Chapter 8- Data Governance outlines the roles and responsibilities that are essential for ensuring data quality, and the value and maintenance of this data over time.

2 Site identification

Site identification is the process of selecting the sites to be audited, including gathering metadata. These features will generally remain consistent over time as the site is developed.

The first step in the audit methodology is to define the areas which are being audited and capture core metadata for these sites. A detailed methodology for collecting site metadata, including a data dictionary, is provided in Appendix 1.

2.1 Scope of Audits

The focus of the audit is land that is zoned or otherwise identified for significant future housing development and growth. This primarily includes 2 types of land:

1. Greenfield land, meaning land that has been rezoned from rural or non-urban land to be developed and used for urban purposes, primarily housing
2. Major infill and urban renewal land, such as strategic centres, corridors, and precincts.

Typically, sites should only be audited if they will make a significant contribution to supply and are able to deliver above a minimum number of lots (for example, 20-30 lots). The threshold of what constitutes a significant contribution will need to be determined based on regional and local context. Figure 3 provides an example of how this may be applied in practice.

The audit should include sites in various phases of planning and development, including those that already have approvals in place but where the expected housing capacity has not yet been exhausted.

Where smaller localities are likely to experience multiple sites of more than 30-50 dwellings, these smaller sites should be included in the audit and could be grouped together as a combined site (refer to Figure 3).

The second step in the audit, site analysis, may identify areas in large sites that have differing environmental and/or infrastructure constraints that would influence the timing of development within these areas (see Chapter 3). In this case, consideration should be made as to whether large sites should be split into multiple smaller sites.

This guidance on the minimum threshold for audit sites should be taken as a guide rather than a firm rule. Professional judgement may be required at times to determine which sites to

include in an audit. The methodology used for a given audit will, need to be justified and clearly explained in audit documentation.

Once a site has been identified, site metadata must be collected on the nature of the site, including its boundaries and size (Refer to 9.1 for detail).

2.1.1 Stakeholder Engagement

Following the collection of site metadata, auditors must engage with council to verify:

- the most appropriate dwelling yield threshold for the LGA
- the identified sites and their boundaries
- any 'investigation areas' to be included in the pipeline audits.

2.1.2 Dispersed Infill

The primary focus of the Housing Supply Pipeline Audit is to identify a long-term pipeline of housing opportunities, track the progress of sites through the development pipeline from initial investigation and strategic identification to being development ready; and to identify any infrastructure, biodiversity and environmental constraints.

Given the above, the audit methodology is considered best suited to monitoring development that can be tracked through stages of the pipeline and requires the resolution of constraints such as greenfield and major infill development or urban renewal projects.

This methodology is not intended to capture development that is incremental or dispersed across existing urban areas. This is because such development is typically delivered within existing zoned capacity on land that is free from constraints (noting that infrastructure upgrades may be needed over time to support cumulative development) and because the extent and rate of dispersed infill development is not easily predictable. As a result, audits undertaken in accordance with this methodology will need to be supplemented by additional analysis on the expected contribution of dispersed infill development to housing supply, including consideration of how much and when existing zoned capacity will be taken up based on development feasibility, DA activity and historical trends.

2.1.3 Monitoring and Review of Audit Data

Site metadata should be reviewed in each successive audit to ensure details remain up to date and capture any changes. Changes may occur to site ownership or boundaries, for example, a large development site with concept approval may be broken into separate sites. However, it is expected that most of the time, data related to site identification will not change between reviews. The frequency of this review should be at least annually, but site information may need to be updated as new information emerges or changes occur.

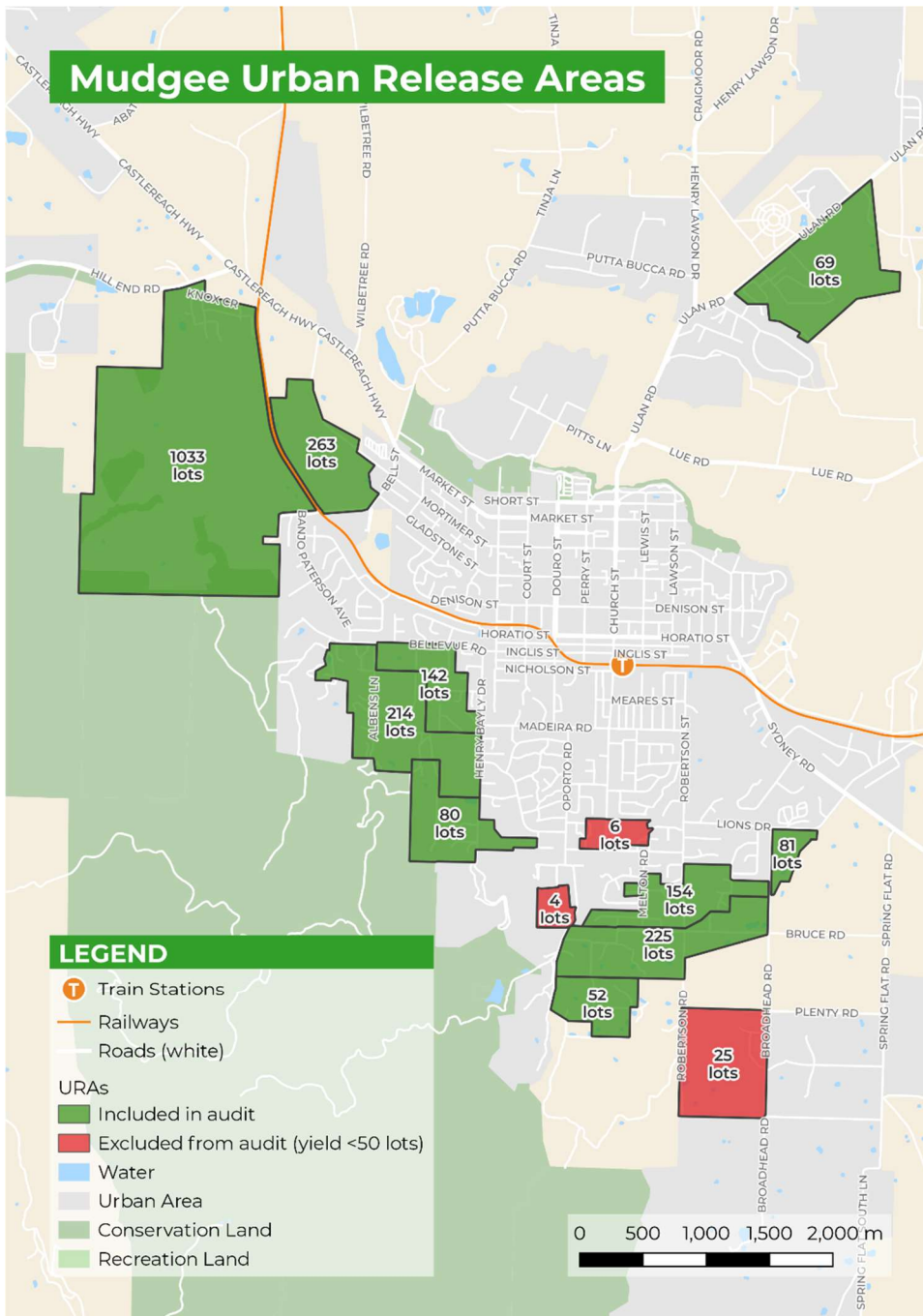


Figure 3 Example of identifying small area lands for auditing

Step 1 - Site Identification Checklist

- Identify dwelling yield threshold for the inclusion of sites based on local context.
- Review Strategic planning documents/Planning Proposal data/DA data etc to identify relevant sites
- Record key site metadata
- Engage with councils to verify the identified sites and their boundaries as well as the minimum threshold values

3 Site analysis

Site analysis is the process of recording the stage a site is at in the planning system, its housing potential and any constraints impacting on the progression of land through the housing supply pipeline and delivery. The combination of these features will determine the complexities associated with future development on the land. Site information will need to be updated over time as planning, environmental, and infrastructure constraints are resolved.

Following the identification of audit sites, planning status and specific infrastructure and environmental information is captured. The purpose of this step is to understand the status of the site, the nature and complexity of site constraints, how long it may take to resolve these constraints, and the potential development yield of a site (taking these constraints into account).

Typically, the information required at this stage can be compiled through desktop research. Auditors must also engage with relevant stakeholders such as local governments, state agencies, development industry and infrastructure providers to verify data and address information gaps including associated risks/mitigation timeframes.

Identifying the data required to complete land capability assessments can be challenging. Varying levels of information about land capability are available depending on the stage of site investigations, the availability of local knowledge, and the quality of data. The methodology provided attempts to balance the difficulty and expected resourcing required to obtain this information against the value of gathering this data.

3.1 Planning status

The planning status of a site should be easily determined based on how far a site has progressed through the planning process. This will enable identification of where housing lands are in the planning system, such as being at planning proposal stage. Key information to be recorded includes whether:

- the site is strategically identified
- the site requires rezoning or amendment of planning controls
- there is a current or imminent planning proposal for the site
- the site is already appropriately zoned

- the site has received consent for subdivision or development
- any subdivision has been registered

A strategically identified site is one identified in a relevant strategy, such as a Local Strategic Planning Statement, Local Housing Strategy or Growth Management Strategy, that has been publicly exhibited, approved or endorsed. However, there may be situations where it is appropriate to capture a site in the audit that has not yet been formally identified in a strategic plan, for example, an investigation area whose suitability for housing is not yet well understood. Local planning knowledge and expert judgement will be necessary to identify these sites.

Answers for each of these fields will provide a planning status based on the decision tree shown in Chapter 4.

3.2 Environmental constraints assessment

Environmental constraints are often the biggest barrier to enabling land for residential development. The audit should capture detail of any unresolved environmental constraints that will have an impact on how land can be unlocked for housing delivery or on delivery capacity or timeframes.

In some instances, environmental constraints may have already been identified and mitigated or otherwise shown not to be a barrier to development as part of the strategic planning and rezoning process. Where this is the case, it is not necessary to record further detail about proposed mitigation measures and the constraint should be recorded as being resolved.

However, where there are outstanding environmental constraints or there is a policy change or changing environmental risk factors that will impact on development, more detail is required.

The key details required are:

- The **presence** of a type of environmental constraint
- The **risk** the constraint poses to development delivery
- Whether **mitigation** has been identified (and the likely timeframe for mitigation).

Once the presence, severity, and potential mitigation (with timeframe) of each environmental constraint has been identified separately, the land can be categorised as per the process described in Chapter 4.

It is understood that not all required information may be available and is dependent on how advanced planning is for the site. For example, while the presence of a constraint may be apparent the severity of the constraint and whether it can be mitigated may require further investigation.

3.2.1 Identification of environmental constraints

Firstly, the audit should note whether any of the follow environmental constrains are present on the site:

- Ramsar wetland
- Strategic agricultural land
- Bushfire prone land
- Flood affected land
- Heritage item
- Heritage conservation area
- Environmental conservation area
- Native vegetation
- Koala habitat
- Airport noise
- EPA contaminated site
- Landslip risk

Typically, the presence of environmental constraints can be identified through desktop research. However, where this information cannot be known, or requires further investigation the audit should be completed by indicating 'further investigation required'.

3.2.2 Environmental constraint risk

For each constraint identified as being present, the extent to which the constraint impacts development delivery should be identified. The defined categories for the purposes of the audit are as follows:

- **Resolved** – constraint has been addressed and requires no further action
- **Low risk** – constraints are well understood and can be resolved easily
- **Medium risk** – constraints are well understood but may require additional time and resources to resolve
- **High risk** – constraints will likely require significant time and resources to resolve
- **Critical risk** – constraints are likely to prevent lands from progressing to housing delivery.
- **Further investigation required** – the risk of the constraint to development delivery cannot be readily determined and more information is required to determine how the constraint will impact development.

Auditors are required to exercise their professional judgement based on available information to determine the severity of constraints for the purposes of categorising the site.

It is expected that the level of severity assigned to a site identified in the audit may change over time as more information is available or as constraints are addressed. Where necessary, and for critical and high-risk constraints, auditors should include within the audit some brief commentary about the rationale for risk category selection, such as a brief description about the nature and extent of the constraint.

3.2.3 Environmental constraint mitigation

The potential mitigation measures for each unresolved constraint should also be defined wherever this is known and material to delivery of the development. Auditors should seek to provide brief commentary about whether a mitigation process has been identified (and what that process is), and the expected timeframe for when it is reasonably expected to be completed.

3.2.4 Example site environmental constraint table

In this example site, two constraints have been identified. The bushfire prone land has an identified mitigation measure but an unknown mitigation timeframe, while the Koala habitat is of medium severity with no known mitigation process and expected mitigation time frame of 2.5-5 years.

The decision tree shown in Chapter 4 illustrates how this overall status is used to categorise the site into the housing land pipeline.

Table 1 Example site environmental constraints tables

Constraint	Prescence	Risk to development delivery	Has mitigation process been identified?	Commentary	Expected mitigation timeframe (years)	Commentary
Ramsar Wetland	No					
Strategic Agricultural Land	No					
Bushfire Prone Land	Yes	Low	Yes	Development in accordance with Planning for Bushfire protection guidelines	Unknown	
Flood Affected Land	No					
Heritage Item	No					
Heritage Conservation Area	No					
Native Vegetation	No					
Environmental Conservation Area	No					
Koala Habitat	Yes	Medium	No		2.5-5 years	Koala Assessment Report being prepared.
Airport Noise	No					
EPA Contaminated Site	No					
Landslip Risk	No					

3.3 Biodiversity assessment

Meeting requirements under the *Biodiversity Conservation Act 2016* is a key step in the planning and development process that must be considered in an audit. Understanding the progress of a development requires the following information to be recorded:

- Is a biodiversity assessment of the site required under the NSW Biodiversity Conservation Act 2016?
- Has a Biodiversity Development Assessment Report (BDAR) or Biodiversity Certification Assessment Report (BCAR) been approved?
- Have any requirements in the BDAR/BCAR been met, including any biodiversity credit obligations?
- If requirements in a BDAR/BCAR have not been met, when are they expected to be resolved?

There are a range of reasons why biodiversity credit obligations may not be resolved such as impacts on development feasibility or a lack of appropriate credits in the market, therefore, additional commentary may be used to provide detail on why a development has an approved BDAR or BCAR but has not met requirements in order to progress development.

It is understood that accurately completing a biodiversity assessment is dependent on the availability of data and evidence. Consultation with relevant local and state agencies is considered the best source of information on level of risk and mitigation timeframes. Auditors should engage relevant agencies including local government to address any information gaps.

3.4 Enabling infrastructure assessment

Understanding the capacity of enabling infrastructure is crucial in understanding a site's status in the housing land supply pipeline and the likely timeframe for delivery. There are four categories of enabling infrastructure:

- **Road Infrastructure:** this includes direct road access to a site as well as wider road network upgrades such as intersections and interchanges.
- **Water Infrastructure:** trunk water mains and capacity to enable a developer to provide lead in infrastructure.
- **Sewer Infrastructure:** trunk sewer mains and capacity to enable a developer to provide lead in infrastructure.
- **Electrical Infrastructure:** access to a zoned substation with adequate capacity to support further development.

3.4.1 Measures

When undertaking an enabling infrastructure assessment there are four key measures:

- The **servicing status** of the infrastructure: This measure assesses whether a site has access to the required enabling infrastructure. This can also measure the capacity of the enabling infrastructure to support further development. 'Unknown' is also an acceptable answer where it is unclear, or data is unavailable to determine if a site is serviced.
- The **project status**: For each category of infrastructure, if the site is not serviced, it must identify if there is a capital project to service the site. This should also identify who is responsible for delivering the project, be it a state infrastructure agency, local council, or proponent and whether or not there are any outstanding approvals required.
- The **funding status** of the project: Where a project and delivery responsibility are identified, identify if the project has funding. If the project does not have committed funding or a business case, identify a timeframe for funding to be resolved.
- The **delivery status** of the infrastructure project. Where a project and delivery responsibility are identified and the project has funding, identify the likely timeframe for the project to be delivered. This should note the likely year for project delivery.

It is understood that the ability for the Auditor to accurately complete this section is dependent on available data and evidence and will likely be limited by the extent of any enabling infrastructure assessments and/or servicing strategies that have previously been undertaken for the site or a broader strategic investigation area.

Consultation with local or State infrastructure providers is considered the best source of information on servicing capacity and the status of infrastructure delivery needed to support development. Auditors should engage relevant infrastructure providers including local government to address information gaps and check the accuracy of responses.

3.4.2 Further assessment

While the audit will help to identify constraints related to infrastructure provision, it is not within the scope of the audit to undertake further detailed analysis or assessment. Further detailed investigations or studies to better understand infrastructure gaps and servicing to support housing delivery and to inform UDP committee consideration of infrastructure priorities may be necessary to supplement the audit.

3.5 Housing capacity and supply

To understand the potential housing capacity from housing growth areas, the audit captures data on total and residual housing capacity, along with likely future development timing. This information helps identify the adequacy of housing land supply to meet dwelling demand across different geographies, stages, and time horizons of the housing supply pipeline.

3.5.1 Housing capacity

The first step to estimate potential future housing supply is to assess the potential site yield and the housing that will be delivered by the development of the site.

The identified capacity of a given site can be expected to change and become more accurate over time as a site progresses through the planning system and more detailed planning occurs. Site density will be influenced by factors such as planning controls, local context and built form, recent development, market conditions, desired future character and infrastructure and environmental constraints.

The capacity of a given site should be reviewed in each successive audit to consider any new information or detailed planning that may have taken place since the last audit.

Where a site's yield has not been subject to detailed investigation and planning, its capacity can be estimated using dwelling yield figures from the relevant regional plan, a background study, a planning proposal or other project documents.

Where these estimates do not exist or are not considered suitable or reliable, housing capacity should be derived by undertaking an analysis of prevailing local development outcomes for comparable scenarios, along with consideration of the site boundary, developable site area, any site constraints, any applicable planning controls, and the expected building typology.

Density rates and theoretical dwelling capacity should be reviewed by stakeholders to confirm assumptions and outcomes.

3.5.2 Completions and residual capacity

Once total site capacity has been identified, a residual capacity figure should be calculated for sites where development is in progress using dwelling completions data. Tracking completions is vital to understand the pace and progress of development at given sites and where and what type of housing is being delivered across a broader area. Where possible completions should be counted on a net basis, subtracting any demolitions, and considering both single and multi-dwelling housing numbers.

Dwelling completions data can be combined with a measure of existing dwellings to count the total number of dwellings completed at a site to date. This can then be subtracted from the

dwelling capacity to measure the residual capacity for housing supply at a site. Completions data can be obtained from a variety of sources, including:

3. Water connections data
4. Occupation certificates
5. Geocoded National Address File (G-NAF) data (historic and current)
6. Manual or automated review of aerial imagery to identify lots that are vacant, under construction or completed
7. ABS dwelling completions

Other data sources may be available depending on location.

Once a site's capacity has been exhausted, it ceases to be captured as part of the housing supply pipeline.

3.6 Stakeholder Engagement

Following the completion of the above steps, auditors must engage with local government, state agencies, the development industry and infrastructure providers to verify the data and address any information gaps.

Step 2 - Site Analysis Checklist

- Review Strategic planning documents/Planning Proposal data/DA data etc to verify planning status
- Identify environmental/biodiversity constraints as well as the associated risks and mitigation timeframes
- Identify key Infrastructure barriers (servicing status, funding status, project status and delivery status)
- Where necessary, undertake Capacity Assessment, agree and document assumptions
- Engage with relevant stakeholders such as local governments, state agencies, development industry and infrastructure providers to verify the data/dwelling yield assumptions and address information gaps including associated risks/mitigation timeframes.

4 Site Categorisation

This chapter describes the process of assigning a site to a stage in the housing supply pipeline. The stages in the pipeline reflect the status of the site in the planning system and how close the land is to being ‘development ready’ based on a combination of factors including how long it is expected that any environmental or infrastructure constraints will be resolved.

4.1 Housing supply pipeline categories

Once sites have been audited, they can be categorised into the stages of the housing supply pipeline.

Categorising sites in this manner allows for site information to be aggregated from the bottom up to identify the overall housing supply pipeline for a larger area, such as a town, city, LGA, subregion or region. Over time, the progress of land through the pipeline and the adequacy of zoned housing land capacity to meet demand can be monitored. Barriers to land becoming ‘development ready’ can also be identified, and the audit can help inform any interventions needed to support delivery of housing and the prioritisation of government funding and effort.

Housing supply pipeline categories are defined in **Table 2** below:

Table 2 Housing supply pipeline categories

Tier	Description	Definition
5	Investigation areas	Potential future investigation, land is not identified in a strategic plan. The suitability of these sites to deliver housing is subject to further investigation, likely to require changes to established planning controls, the delivery of enabling infrastructure and/or environmental offsets strategies. These sites are therefore not counted towards current housing land capacity.

Tier	Description	Definition
4	Strategically identified land	Land identified in a strategic plan (such as Regional Plan or Local Housing Strategy and/or LSPP) - While strategic investigation will have typically confirmed suitability of these sites from a land use planning perspective more detailed investigation and planning and approvals are required. These sites are therefore not counted towards current housing land capacity.
3	Land under consideration for rezoning	Changes to LEPs controls including re-zoning are underway with the land being subject to a current or proposed planning proposal (e.g., at pre-lodgement stage) that is yet to be determined. These sites are not counted towards current housing land capacity.
2b	Longer term zoned land supply (more constrained)	Land is zoned, environmental or infrastructure constraints are likely to be resolved in 5+ years. The pathway to resolution may not be well understood or it may be understood but there may be a funding or implementation barrier or barriers that requires resolution that are unlikely to be addressed within 5 years
2a	Medium term zoned land supply (less constrained)	Land is zoned, environmental and/or infrastructure constraints are likely to be resolved within 5 years. The process by which constraints are to be resolved is complete or underway with a high degree of certainty around any mitigation requirements. Trunk infrastructure may be funded but not delivered.
1b	Short term zoned land supply (awaiting development consent)	Land is zoned, infrastructure enabled and bio certified. This land is fully or substantially serviced by enabling infrastructure but has not received subdivision approval.
1a	Development ready land	Land is zoned, infrastructure enabled, bio-certified and subdivision approved.

4.2 Site categorisation process

To categorise a site, a series of questions need to be answered across 4 sub-categories: planning status, environmental status, biodiversity status, and infrastructure status. Based on the answers to these questions, a site will be assigned a tier for each sub-category using the decision tree processes outlined in the following pages.

The overall site category will be determined based on the highest sub-category tier it has been assigned. Some examples are provided below.

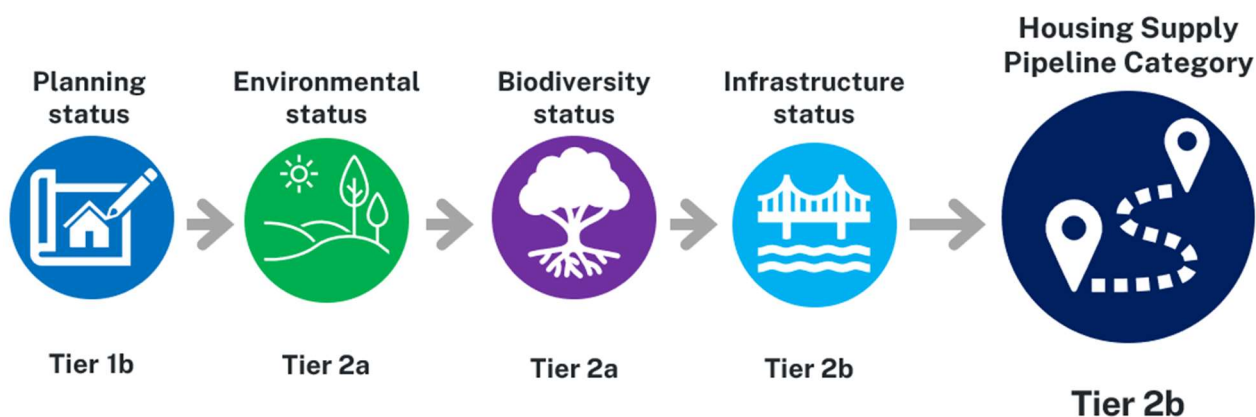


Figure 4 Site categorisation process

For a site to progress through the land supply pipeline, it must satisfy the conditions of each sub-category to ultimately progress to Tier 1a and be considered development ready land. Where a site has a lagging category (see Site B in the example below), interventions may be needed to progress the site, either government or industry.

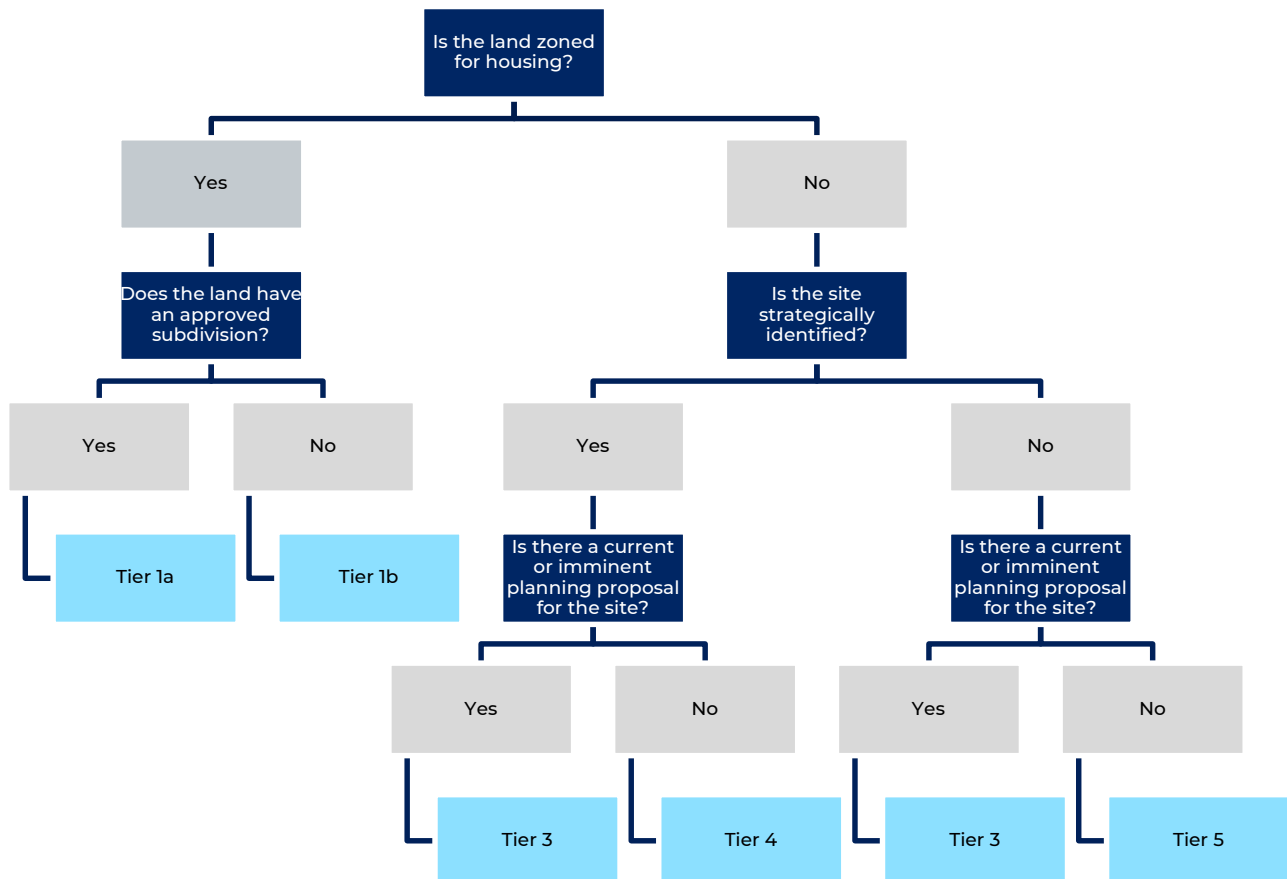
Table 3 Site categorisation example

Sub-category	Site A	Site B
Planning status	Zoned, no subdivision approval Tier 1b	Zoned, no subdivision approval Tier 1b
Environmental status	Environmental constraint with mitigation pathway identified within 2.5-5 years. Tier 2b	Environmental constraint with mitigation pathway identified within 0-2.5 years. Tier 2a
Biodiversity status	A Biodiversity Development Assessment Report is required but has not been approved Tier 2b	A Biodiversity Development Assessment Report has been approved with requirements expected to be met within 0-2.5 years. Tier 2a

Sub-category	Site A	Site B
Infrastructure status	Enabling infrastructure is required but no project has been identified. Tier 2b	Site is serviced and there is adequate capacity in enabling infrastructure. Tier 1a
Land Supply Pipeline Category	Tier 2b	Tier 2a

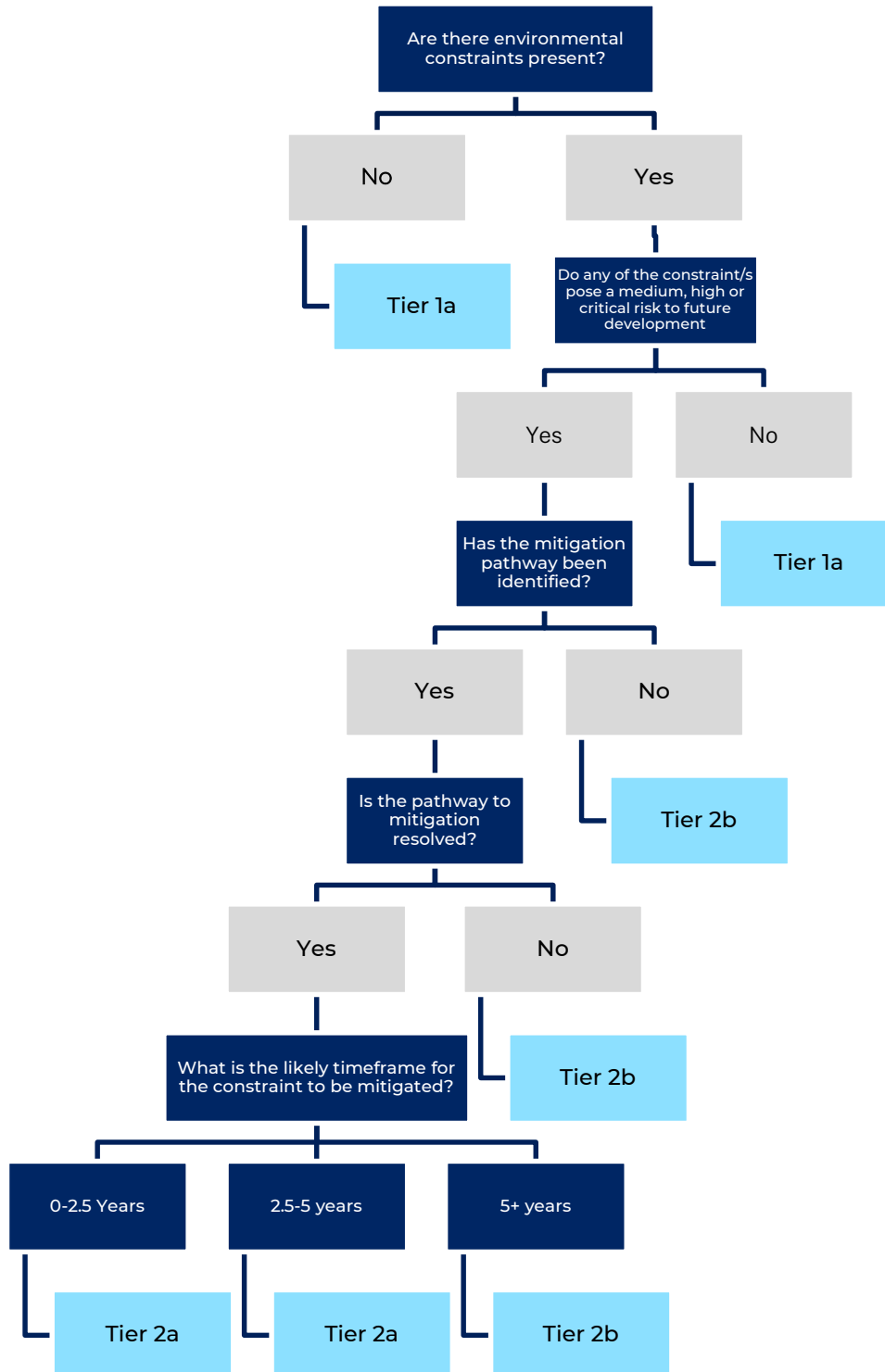
4.2.1 Planning status

The following decision tree provide a method for categorising sites into different pipeline category tiers based on the planning status.



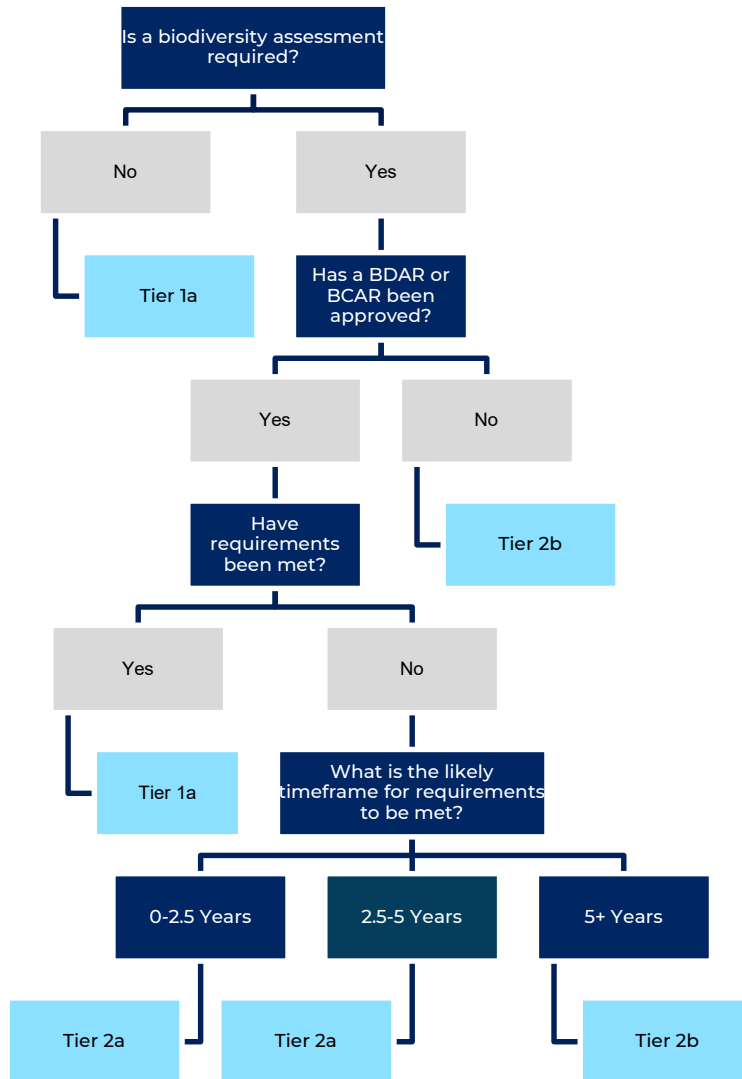
4.2.2 Environmental status

The following decision tree provide a method for categorising sites into different pipeline category tiers based on the environmental constraint status.



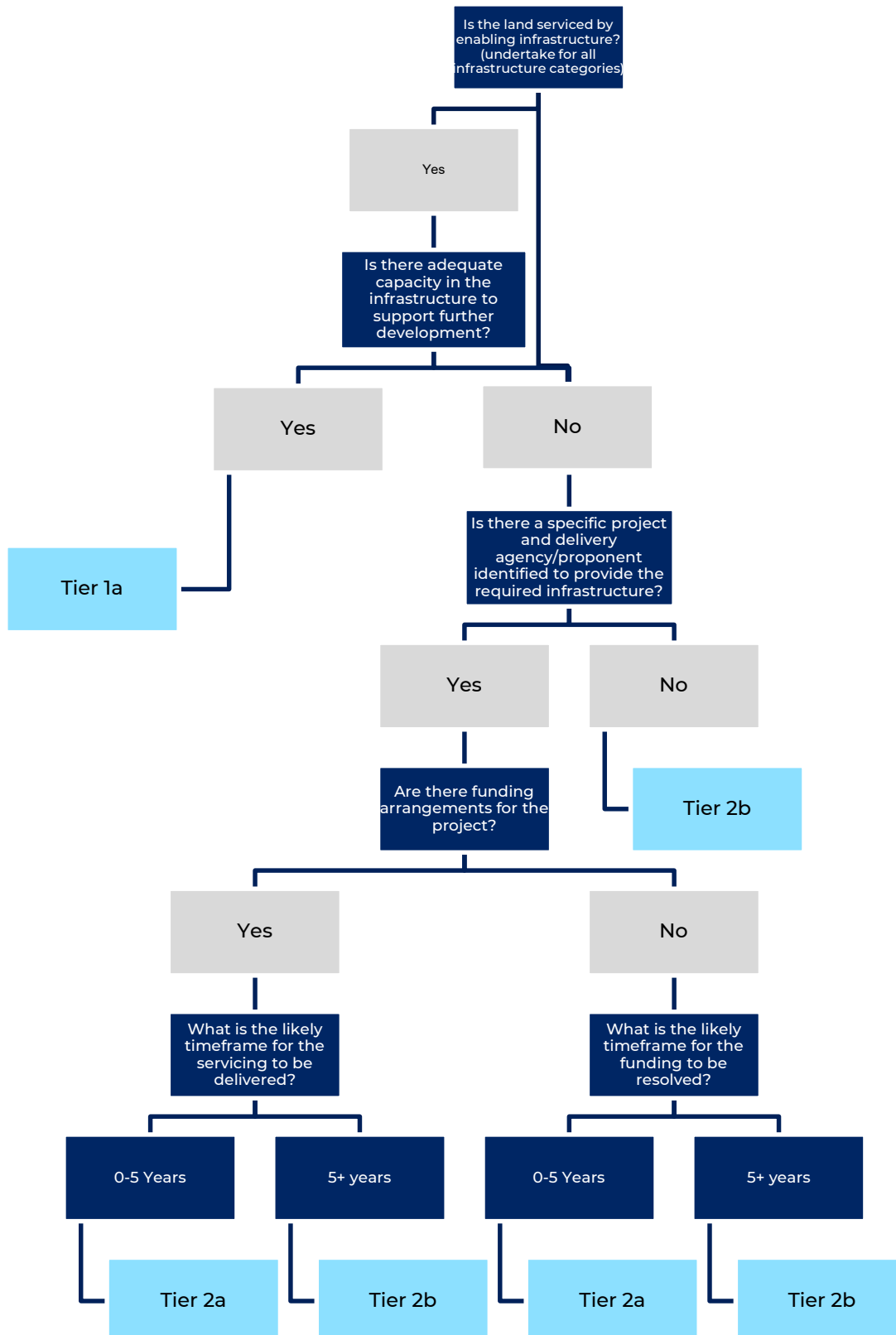
4.2.3 Biodiversity status

The following decision tree provide a method for categorising sites into different pipeline category tiers based on the stage and resolution of biodiversity requirements on a site.



Infrastructure status

The following decision tree provides a method for categorising sites into different pipeline category tiers based on the enabling infrastructure status.



Step 3 - Site Categorisation Checklist

- Using the decision tree process, categorise each site across 4 sub-categories: planning status, environmental status, biodiversity status, and infrastructure status
- Determine the overall site tier
- Prepare **Pro-forma excel template to be** sent to key stakeholders (including councils and the UDP committee representatives) for review and validation
- Ensure that site categorisation rules have been followed correctly, for example by checking that the overall categorisation is not lower than any lagging sub-category tier.

5 Data Validation and Forecasting

The final step in assessing a site's housing supply potential is to validate the completed audit and undertake a forecast of likely development timing. Forecasting provides information on when new supply may be delivered, how quickly existing housing land supply could be exhausted and how sites progress through the planning system into housing construction and delivery. Forecasting itself will be undertaken by DPHI in collaboration with the UDP Committees. To supplement the detailed audit, additional analysis on the rate of housing expected, or delivered outside of growth areas will form part of a UDP's annual Housing Land Monitoring Statement.

5.1 Data Validation

Post Site Analysis step, the final audit data, including the proposed site categorisation, will be sent to key stakeholders (including councils and the UDP committee representatives) for review and validation. Validation of the audit findings will provide stakeholders with a final opportunity to consider the accuracy of data and evidence and provide any final input.

5.2 Forecasting

Information on projected development timing should capture programmed housing completions over a five-year period. Remaining capacity to be delivered beyond this five-year period will simply be captured in a single category of "beyond 5 years". This is because there is more uncertainty in longer term staging estimates. See **Table** below for an indication of how this information will be captured for a given site.

This information should be captured through consultation with developers, landowners and/or relevant planning consultants who can provide feedback via a survey on potential site yield, residual capacity, and current construction activity.

For sites where development timing information cannot be obtained, other forecasting or projection methodologies may be applied to identify the likely 5- year development programme for a given site or area. This can be either through extrapolation based on historic trends or through more detailed analysis of factors such as construction activity and average approval and construction timeframes, prevailing market conditions, and so forth. The method

used may depend on local data availability. Where historic completions data is not available for a site, nearby areas can be used a proxy to understand the likely delivery and take-up of housing.

Table 4 Estimated housing potential, remaining yield and development timing

Site	Total capacity	Remaining estimated dwellings	FY2023-24	FY2023-24	FY2023-24	FY2023-24	FY2023-24	5-year total	Beyond 5 years
West Growth Area	2,180	2,080	100	150	150	300	350	1,050	1030

For the purpose of the audit, completions timing information should only be captured for land that has already been zoned for housing. It will be assumed that all potential housing on land that has yet to be rezoned, including land that is currently subject to a planning proposal, will be delivered beyond the 5-year timeframe.

Over successive audits, it can be expected that 5-year forecast development numbers will vary due to factors such as changing market conditions, materials and labour cost and availability, and dependency on factors such as infrastructure funding and delivery and planning approvals. Professional judgement should be used as to the reliability of survey data, and it is advisable to compare survey results with other forecasts and projections in order to develop an accurate picture of delivery timeframes and capability.

The 5-year forecast development figures are understood to be informed estimates only and are not suitable for use as housing delivery targets. The 5-year forecast development figures will also only be limited to sites included in the audit and will not reflect total likely development activity. Projections for other development, such as dispersed infill or rural residential development on sites that are not captured in the audit, would need to be identified outside of the audit process.

6 Reporting, review and monitoring

Once audit data has been collected, a summary report should also be produced that presents the data in a summarised form. This will ensure this data is readily available for use in decision making and developing insights.

A regular review and monitoring process is essential to enable an assessment of how the pipeline in an area has progressed over time, as well as the status of individual sites.

6.1 Audit Data Statement

Once all data has been collected, an Audit Data Statement will be prepared that presents the information in a summarised form for use in monitoring, decision making and developing insights. The report shall be prepared in a form

The level of detail in this data statement may vary, including where data collected is sensitive in nature and not suitable for publication. Data statements will include the following information at a minimum:

- Background and context for the audit, including information on the timing and scope of data collection and the data sources used
- Housing supply pipeline summary, including an assessment of the capacity of zoned and development ready land supply to meet housing needs
- A site audit summary, including summaries of the status of significant sites and constraints identified through the audit
- Data tables (note: the level of detail in data statement may vary, including where data collected is sensitive in nature and not suitable for publication)

This statement can be used as input into other processes and investigations and will be a critical input into the UDP annual reporting, which provide additional analysis and insights on housing land and housing supply issues. Audit data statements can also inform local and regional strategic planning, including being used to monitor performance against any housing land benchmarks or targets.

6.2 Review and monitoring

Regular reviews and monitoring of sites are essential. There is a significant initial outlay in resourcing required to establish a housing land supply audit and database. Without maintenance and monitoring, this quickly becomes dated and unreliable, requiring the entire process to be repeated from the beginning.

However, the additional work required to ensure site level data remains up to date is relatively minor compared to the initial audit. Only a subset will be progressing through the pipeline, and most changes will be minor evolutions rather than a complete reassessment of the site and its status.

It is therefore recommended that all audits undertaken are reviewed annually.

7 Utilising insights from an audit

The outputs of the audit can also be potentially used for a range of complementary land use planning processes. Whilst they are intended to primarily support UDPs by providing a housing land monitor and identifying where interventions may be needed to progress housing lands, they can also provide input for example to local housing strategies by providing a rich source of data on the status of local housing lands yet to be developed.

Data collected through the audit enables analysis of the future pipeline of housing supply against current and projected demand in the UDP annual Housing Land Monitoring Statement. This analysis will identify and project unmet housing needs and provide context in understanding the urgency in which support or intervention is needed to remove constraints to development. Common Planning Assumptions such as implied dwelling demand can be used to understand whether current land supply meets need, alongside finer grain analysis of housing demand where available.

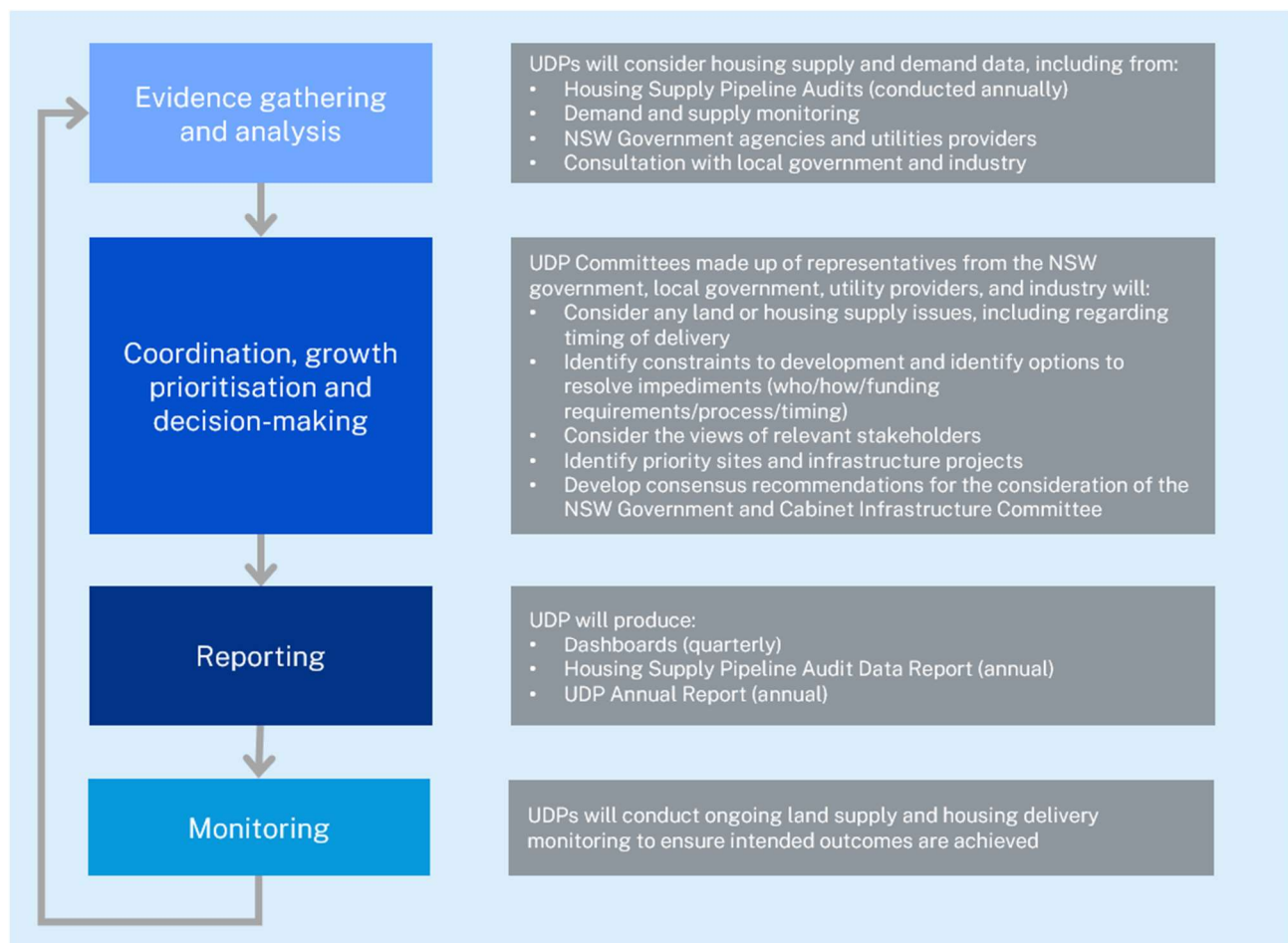


Figure 5 Urban Development Program framework

8 Data governance

Appropriate data governance arrangements are essential given the large amount of data being gathered. Appropriate governance arrangements enable reliable data management. Without this, the full value of the data is unlikely to be realised, and the resourcing required to perform and maintain the audit is likely to be increased.

To minimise confusion surrounding the different roles, tasks, and accountabilities required to maintain a housing land supply database, it is essential to have well-defined data governance roles and responsibilities.

The three main roles for data governance are: **Data Owner** , **Data Steward** , and **Data Custodian**.

8.1 Data owner

A data owner is the person – usually in senior management – with the authority and access to resources required to manage the overall housing land supply dataset. This role is responsible for ensuring:

- The data dictionary is comprehensive and agreed upon by all stakeholders
- A system is in place for auditing and reporting data quality
- An escalation matrix is in place for data quality issues identified
- Actions are taken to resolve data quality issues within a defined timeframe

Specific day-to-day actions that ensure these standards are maintained may be delegated, however it is essential to have a data owner to ensure adequate authority and access to resources can be mustered when necessary to ensure appropriate data processes and data quality is maintained.

8.2 Data steward

A data steward is a subject matter expert primarily concerned with ensuring the correct usage of the data, and therefore should have a thorough understanding of the purpose and process of the housing supply pipeline audit – connecting detailed understanding of the dataset with the big picture.

They should have experience in both planning and geospatial subject matter areas. This ensures that they can provide expert advice on all relevant aspects of the database. Multiple data stewards with differing subject matter expertise may be appointed as needed, to provide expert advice on separate components of the overall database.

8.3 Data custodian

A data custodian has responsibility for the day-to-day maintenance and management of the dataset. They do not need to have deep understanding planning or the purpose of the housing supply land audit database – that guidance and level over oversight is the responsibility of the data steward.

9 Appendices

9.1 Appendix 1 – site audit metadata

9.1.1 Site identifier (ID)

A unique and consistent identification code is required for each site in the residential land use audit. This code will enable the Department to link each site with other associated data to track changes over its lifetime. Each code is unique and persists even after the site has been completed.

The unique identification code (unique ID) should be structured as following:

- Local Government Area code (Australian Statistical Geography Standard Edition 3 LGA coding structure)
- Number (individual number code, numbered progressively)

An example of this code is:

- LGA: Central Coast Council (11650)
- Number: The 25th site identified in the audit (25)

Output field example: 11650_25

Data type: String, unique ID [required]

9.1.2 Site name

While each site is identified by its unique ID, a name is helpful when reporting on a site. This name may be defined by the developer, a strategic plan or may reference a planning proposal. Where a site is broken up into stages, the full name should be used.

In the absence of an existing defined name, a descriptive placeholder can be used. A site may have multiple names over the course of its life. Separating site name from site ID allows for multiple name changes without disrupting the coherence of the database.

Examples of site names are:

- Site name: West Dapto – Stage 1 – Wongawilli (North)
- Placeholder: South East Gulgong

Output field example: Drualla Road

Data type: String [optional]

9.1.3 Site boundary

The site boundary is a polygon defining the subject property boundaries of the site. Defining this using a spatial data type enables spatial analysis to be performed more easily. Additional spatial information can be captured as needed by performing a spatial join with other datasets (e.g. cadastre for Lot / DP).

The specificity of the site boundary is often related to how well progressed the site investigations are and may become more defined as the site progresses through the pipeline.

Data type: Spatial [required]

Note: GDA2020 is the most appropriate geospatial reference system. The department should confirm the timing of the migration from GDA94 to GDA2020 with their internal GIS team.

9.1.4 Site area

The site area should be calculated from the polygon shape defined in the previous step. For this data to be meaningful, a planar (projected) reference system needs to be agreed upon for the site boundary. This measure should be defined in square metres.

Output field example: 1005672

Data type: Int64 [optional]

9.1.5 Ownership type

The ownership type field identifies the sector of ownership of the site.

If the land ownership of a site is known, this field should be defined. If unknown, it should be left blank.

While there is value in identifying specific owners, this is too detailed for the purpose of the land database and should be undertaken as a separate exercise by joining the spatial field with land and property information as needed.

Suggested ownership type categories are:

- Local government
- State government
- State agency
- Local Aboriginal Land council
- Developer
- Private

- Combination

Output field example: Local government

Data type: String [optional]

9.1.6 Number of lots

A count of the number of lots inside the site boundary is a simple measure identifying the level of fragmentation and complexity at a site. This can be done using a simple spatial join between the site boundary and the cadastre.

Output field example: 3

Data type: Int16 [optional]

9.1.7 Urban form type

Urban form type identifies the category of site being developed. Different urban form types may have distinct housing markets, typologies, delivery issues, and priorities. Tracking these different land use categories can aid in decision making and analysis.

Due to site identification decisions and the minimum lot threshold, it is likely that most site will be Greenfield release and urban expansion, or renewal precincts and sites. Only particularly large or significant dispersed infill and rural residential sites should be included in the residential land audit.

Suggested urbanity type categories are:

- Greenfield release and urban expansion (G)
All greenfield or urban extension land areas where no residential development has previously occurred.
- Renewal precincts and sites (RP)
Identified renewal precincts or brownfield sites where existing development is being renewed to residential or mixed-use development.
- Dispersed Infill (I)
Areas identified for dispersed infill development. These areas are often larger in size and relate to existing centres or suburbs. The boundary of these areas is defined by the expected density. Where higher density is expected in one location compared to another, separate areas should be identified.
- Rural Residential (RR)
Rural residential development refers to land in a rural setting, used and developed for dwellings that are not primarily associated with agricultural uses.

Output field example: G

Data type: String [optional]