Australian Bureau of Statistics

ANZSCO MAINTENANCE STRATEGY

Core components of a new approach to maintaining the Australian and New Zealand Standard Classification of Occupations

June 2022

Contents

1 EXECUTIVE SUMMARY

ANZSCO is out of date, based on 2001 labour market data. It has received minimal revision over the last 20 years and lacked significant investment to maintain ongoing updates.

Traditionally, review and analysis to support updates has relied predominantly on Census data. New data sources and methods are required to support more timely updates to the classification.

The core components of a new approach are presented, designed to deliver more frequent and timely updates to the classification in a sustainable ongoing manner, to keep it reflective of the contemporary labour market.

A five-year cyclical update model is presented that balances maintaining robustness and stability of time series data with the need to reflect contemporary changes to the labour market in a timely manner. The model defines minor updates that will be released annually, and major updates that will be released every five years in time to support adoption by the Census of Population and Housing.

The delivery of the update program of work will be supported through the prioritisation framework. This framework describes the factors and process that will be applied by the ABS in prioritising requests for change by stakeholders.

The biannual consultation rounds and communication plans demonstrate the strong commitment by the ABS to open, transparent consultation, and the value placed on stakeholder input to the development of updates.

The components of the strategy will be further refined through ongoing engagement with stakeholders and informed by the comprehensive update to ANZSCO to be undertaken over the next 2-3 years. A final version of this maintenance strategy will be released at that point in time.

2 INTRODUCTION

2.1 HISTORY OF ANZSCO

The Australian and New Zealand Standard Classification of Occupations (ANZSCO) provides the basis for standardised collection, analysis and dissemination of occupation data for Australia. It is an integrated framework for storing, organising and reporting occupation-related information in both statistical and other analytical applications. ANZSCO is used in the Census of Population and Housing, the Labour Force Surveys (LFS), and other ABS surveys to measure and understand the Australian labour market.

ABS and Statistics NZ jointly developed the classification in 2006 when the Australian and New Zealand occupation classifications were combined to form the ANZSCO First Edition. Since then, ANZSCO has only undergone minor revisions in 2009, 2013 and 2019 to address selected emerging occupations, specialisations and region-specific issues and remains largely out of date compared to the current labour market.

In 2021, the ABS trialled a new approach to updating ANZSCO, designed to deliver more regular and timely future updates. Targeted updates focussed on priority areas of ANZSCO were delivered in November 2021, with further updates planned for release in November 2022.

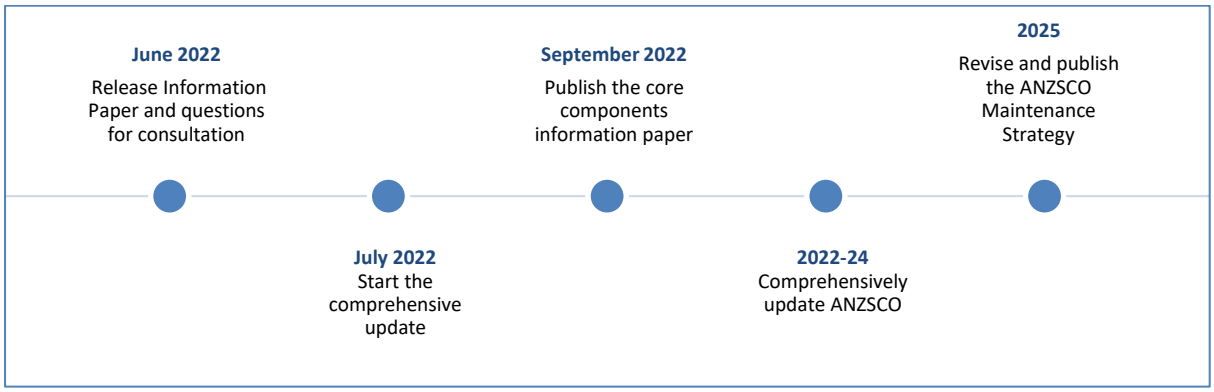
In March 2022, the federal government announced a significant investment as part of the 2022-23 Budget to undertake the first comprehensive update since ANZSCO's formation in 2006. Work towards this comprehensive update is set to commence in July 2022 with delivery of the updated classification in December 2024. The ongoing maintenance strategy will be implemented in 2025, after the completion of the comprehensive update.

2.2 PURPOSE OF THIS PAPER

This paper outlines the core components of the ANZSCO Maintenance Strategy. These components draw upon the experience of other National Statistical Offices and the findings from workshops with key stakeholders exploring ANZSCO use cases.

Several frameworks are proposed to address the issues related specifically to ANZSCO maintenance. The core components will be refined through this consultation round and will undergo further review and refinement after the completion of the comprehensive update scheduled over the next 2-3 years. A timeline for development of the strategy is described in Figure 1.

Figure 1: ANZSCO Maintenance Strategy Development Timeline



2.3 OBJECTIVE OF THE MAINTENANCE STRATEGY

The classification is designed to balance robustness that allows for long-term usage and time series analysis with revisions that ensure the classification is contemporary. Revisions to ANZSCO occur to reflect emerging occupations and/or groups (such as Minor and Major Groups), aggregating declining occupations and/or groups, and changing titles and descriptions of evolving occupations and/or groups.

Large but irregular updates to classifications are costly and limit the ability of the classification to reflect current or emerging trends in the labour market, increasingly so as it draws further from the time of the previous revision.

The ABS has engaged with a range of key partners to develop a modern approach to updating ANZSCO and address the shortcomings of large-scale, costly reviews. Through incremental targeted review and updates, this strategy will achieve the following objectives:

- increased frequency of reviews to better identify emerging, evolving and declining occupations, and other significant changes to the labour market
- improved coherence and alignment to an increasingly dynamic labour market through collaborations with industry and government partners
- reduced cost of maintenance and improved evidence base for decisions by identifying and using new data sources and methods, including machine learning
- effective management of impacts to time series and analysis of occupation data over time.

These objectives will be achieved through the introduction of an update model that constrains annual changes to only those that do not impact time series, and stockpiling changes that would affect the scope and counts above the six-digit occupation level to a one-in-five-year release. Updates to the classification and coding will be informed by a prioritised set of submissions, data analysis and structural review processes intended to achieve a full review of the classification every five years, in time to support the Census of Population and Housing.

3 USE CASES OF ANZSCO IN AUSTRALIA

ANZSCO is used to classify ABS statistics related to occupation in the labour market. Occupation statistics are produced by the ABS through the Census of Population and Housing, the Labour Force Surveys and the Survey of Employee Earnings and Hours. In addition to producing occupation statistics, ANZSCO is used by other organisations to categorise and/or describe their data, and to support policy development, design and implementation. Targeted engagement with key stakeholders from these organisations has informed the development of this strategy, and specifically the model outlined in Section 5. Use cases can be categorised into three broad key areas, briefly described below.

3.1 LABOUR MARKET ANALYSIS

Statistics on the labour market are collected to support varied analyses of wages, availability of skills, transitions, education requirements, areas of growth, unemployment and underemployment and barriers to entry. Labour market analysis plays a critical role in understanding current and emerging trends within the labour force, aiding workforce planning, mobility, and the creation of educational pathways, including those aimed at reskilling. It provides a standard framework for assessing labour market supply and demand issues, and the formulation of policy and program responses.

Labour market analysts have a particularly strong need for ABS to adopt a balanced approach to regular updates. Ensuring the consistency and stability of the classification for time series purposes is of paramount importance.

3.2 SKILLED MIGRATION

One of the mechanisms for addressing skilled labour shortages is through skilled migration. The Department of Home Affairs grants visas to foreign workers on the basis they qualify to work or train in an eligible skilled ANZSCO occupation. The ANZSCO is therefore a critical component in the development of the National Skills Commission's (NSC) Skilled Migration Occupation Lists, which form the basis of government and employer sponsored visa programs. ANZSCO must remain

reflective of the contemporary labour market to adequately enable employers to respond to unmet labour demand through skilled migration.

3.3 EDUCATION AND TRAINING PATHWAYS

The second high level use case outside of traditional labour market analysis is in pre-empting and addressing skills shortages through education and training pathways. ANZSCO is used to identify shortages and subsequently priorities through the Skills Priority List (SPL) produced by the NSC. Numerous entities in the education and training sector map courses to occupations within ANZSCO providing links between skills, qualifications and occupational outcomes.

The ANZSCO-based SPL also plays a strong role in informing future investment in education and training development, as well as prioritising financial incentives for the provision of apprenticeships.

4 PRIORITISATION FRAMEWORK

4.1 DEVELOPMENT OF THE FRAMEWORK

Moving to an annual targeted update model introduces challenges in balancing the need for urgent changes with the long-term maintenance goals. A prioritisation framework has been developed to transparently manage stakeholder expectations and enable efficient delivery of the maintenance schedule. The review team drew on several different prioritisation models in the development of this framework. The framework proposes a set of factors (see Section 4.5), and a process to apply them, to enable the appropriate prioritisation and scheduling of review work.

4.2 FREQUENCY

The priority of existing submissions will be reviewed on an annual basis to ensure currency – this will inform the scope of the following year's targeted update. New submissions will undergo assessment against the factors as soon as practicable after they are received and will be included in the next year's annual priority review.

4.3 SUBMISSION PROCESS

Users will be able to contribute to the review process by providing submissions through biannual consultation rounds. For more information on the consultation model see Section 9. Supporting material will be made available to guide users through the process required to make submissions including the information that can most assist ABS to prioritise and action change requests. The current preferred platform for public consultation is the ABS Consultation Hub.

4.4 ASSESSMENT PROCESS AND PRIORITISATION FACTORS

The prioritisation framework guides the review team through an internal and repeatable process to achieve a fair and consistent treatment of change requests. The prioritisation factors (see Table 1) encourage the reviewer to consider each of five factors separately. The consideration of changes perceived to be minor will involve a small investment, but for complex changes, the review team

may need to commit considerable resources to understand the impact and evidence base for the change.

Table 1: Prioritisation Factors

Factors	Considerations
Benefits	Why is this change to the ANZSCO needed?
	What are the anticipated benefits to the ABS and / or users that this change request would deliver?
	How does this request align to policy, program or statistical / data need?
Risk	What is the impact if the suggested changes are not made to the ANZSCO?
	If the changes are made to the ANZSCO, could there be any disadvantages or unintended negative impacts?
Complexity	Are there any dependencies or links to other programs or work?
	Has any prior engagement/consultation with relevant stakeholders been undertaken?
	What body of evidence is there to support the change request?
Urgency	How long since this concern was first identified? Is there a pressing need for immediate action?
Reach	How strong is the demand for this change across stakeholders? How broad is the set of individuals / groups that would be affected by this change?

Benefits: Users are encouraged to provide an outline of the benefits of the proposal, including benefits that are non-statistical. Clearly articulated benefits aligned to policy, program or statistical need will receive strong considerations during assessment.

Risk: Strong consideration will be given to requests that identify the risk(s) of negative impacts if the concerns raised in the submission are not addressed. Evidence of the risk will aid prioritisation. These risks could include outcomes that undermine confidence in ANZSCO and lead to poor decision making.

ABS strongly encourages users to declare any potential adverse effects from the changes they are requesting. Submissions that can identify any potential side-effects and/or sensitivities of the desired changes will receive greater priority.

Complexity: Some requested changes may have dependencies on other elements of ANZSCO that need to be considered holistically. There may also be complexity regarding implementation and use in labour market analysis. Complex change requests may require significantly greater stakeholder engagement and lead time.

Urgency: The targeted maintenance strategy aims to achieve a comprehensive update once every five years. This means that all categories in the classification will be reviewed and potentially updated within the five-year cycle. Consequently, submissions relating to areas of ANZSCO, yet to be reviewed within the cycle, will receive due consideration. Less urgent submissions will increase in priority as they age within the cycle.

Reach: Reach considers the number of users (individuals/groups) affected by the change, with the greater the number of beneficiaries increasing the relative weight of the review. Submissions that affect a narrower segment of the labour market may not be prioritised over other submissions with far reaching impact.

In addition to these factors, the ABS will also consider: the age of requests; the time since the area of classification was reviewed; and the full set of change requests holistically (to identify economies of scale) in determining the schedule of review work for the upcoming cycle.

5 DATA SOURCE SUITABILITY FRAMEWORK

ANZSCO was developed from a bottom-up clustering of self-reported job descriptions based on the 2001 Census of Population and Housing. Since its first edition in 2006, it has only undergone periodic targeted review. Census data remains the primary data source for review work and continues to inform decisions on updates to the classification, including thresholds for inclusion/exclusion of occupations and changes to the way occupations are described.

The Census data set has several limitations, most notably its five-yearly frequency, seasonal bias, and inability to clearly delineate between some cross-sectoral job titles (for instance, managers, public servants). The detailed data from Census is often only available to the review team when it is released publicly, approximately one year after collection. With the intention of moving to an annual maintenance model, issues with the timeliness of Census data will be further exacerbated.

To improve how ANZSCO reflects the contemporary labour market, it is necessary to incorporate new data sources (such as Personal Income Tax data or job advertisement data) and methods into the review process. This will improve the relevance, timeliness and alignment with labour market and other statistical and non-statistical occupation classifications and lists.

The identification of new data sources and methods provides an opportunity to improve the way reviews are conducted, reduce cost and mitigate any potential risks that accompany a targeted, user driven identification approach (such as the inconsistent introduction of changes, underrepresentation for decentralised groups).

5.1 DATA SUITABILITY

Not all data sources will be suitable to supplement and replace Census data. There are many considerations that need to be made including the quality of the source datasets and the specific review purposes that they will need to support.

The ANZSCO Data Source Suitability Framework serves to ensure that potential data sources are evaluated consistently and with regard for the intended purpose. The purposes for which alternative data sources and methods may be used include:

- ensuring skill levels requirements are current
- reflecting the contemporary usage and understanding of titles, descriptions, and tasks

- identifying and creating new occupations and specialisations including the review of 'not elsewhere classified' categories
- dividing categories with large populations to improve granularity
- forecasting/modelling population counts to support review work
- identifying areas with high potential for change to inform future priorities.

A set of criteria has been developed to assist reviewers with assessing potential data sources. It is based on the quality dimensions codified in the ABS Data Quality Framework but has been adapted to focus on suitability more than quality in recognition that some data sources are administrative and others may only be suitable for qualitative research purposes or for illuminating a niche sector of the labour market.

The dimensional assessment will feed into considerations around feasibility and value, including costs involved in accessing the data sources, building the tools to transform and relate the data, and developing the analytical methods to extract actionable insights. Data source assessments will inform a recommendation, for instance to commence a trial process or to re-assess in 12 months when the data is considered more mature. Acquisition of any new data sources will be undertaken in accordance with ABS legislation, policy and processes.

Table 2: Data Source Suitability Criteria

Dimension	Aspect	Considerations
1. Institutional Environment	Impartiality and objectivity	• Which organisations collect and sort the data?
	Professional independence	• Does the custodian or any third party involved in the collection and aggregation have a commercial direct or indirect commercial interest in ANZSCO updates?
	Mandate for data collection	• What authority or agreement was the data collected under?
	Adequacy of resources	• Does the custodian have sufficient resources to meet on-going production/collection needs?
	Quality commitment	• Does the data include a quality declaration?
	Risks	• Are there any possible reputational risks arising from use of the data source? • Could a contract lock ABS into one custodian/data source, i.e. exclusivity? • Does the custodian impose constraints on how the data can be used?
2. Relevance	Scope and coverage, reference period	• Which populations are covered, and which populations are not covered? • What periods do the data cover? • What geographic and demographic information is available?
	Main outputs/data items	• What key data items are available? • Does the data source include free-text responses?
	Classifications and statistical standards	• What taxonomies are used? • What issues, if any, do the taxonomies used introduce for ANZSCO review processes?

Dimension	Aspect	Considerations
	Type of estimates available	• What types of data are available? *For instance, aggregates, unit record level, rates and percentages*
	Other factors	• How are residuals handled? • What is omitted from the data? • Are there alternative sources of the same information?
3. Timeliness	Timing lag	• What is the gap between the period the data source describes, the time of collection and the time when the data source will be available to the review team? • Is it possible to differentiate data based on when it was collected?
	Frequency	• How often is the data revised, edited, or cleaned? How does this timing align with the review schedule?
4. Accuracy	Coverage error	• How are coverage issues (under and over-coverage) addressed by the data custodian? • Are there issues with over-coverage including duplicate records? *Such as the same job advertisement appearing in different job advertisement websites, or one person having more than one professional network profile* • Is there information available to gauge the potential magnitude of error in the data?
	Sample error	• Is the data weighted? • Is sample error included with the data? • What benchmarks were used in weighting?
	Non-sampling error	• How is processing error managed? • Have adjustments been made to confidentialise the data, such as removing outliers or swapping identifying variables? • Are there questions that are hard to understand?
	Other sources error	• Are there particular issues with the way data is collected that could reduce the accuracy of the data source? *For instance, occupation titles in income tax returns may be prefilled and not up to date* • Has the data been rounded at any stage?
	Revisions policy	• Does the custodian make revisions, including major structural changes? How are they communicated to users?
5. Coherence	Changes to data items	• Is the same concept measured consistently over time? Can a trend be created based on the consistent measurement of the population?
	Comparisons across data items	• To what extent can a reviewer relate data items within the data source? *For instance, is the denominator the same in aggregate data? In unit record data, are all the variables in the same file or are there record identifiers that can support joining datasets?*
	Comparisons with previous releases	• Could external factors have influenced the data since the previous release?
	Comparison with other products available	• Can these/have these data be/been confronted with other data sources?
6. Interpretability	Presentation of the information, availability of information	• Are there any terms that are ambiguous or likely to confuse the review team? • How available is supporting information about the data, particularly metadata and information about provenance?

Dimension	Aspect	Considerations
	regarding the data	Are there information papers or articles to help provide more information into the collection and aggregation methodology?
7. Accessibility	Accessibility	• How easily can a review team member access these data? How is it accessed? • Can it be imported into the ABS environment for further manipulation and analysis? • Is further processing required before these data can be integrated into the review workflow?
	Data products available	• What range of products are available? • What formats are the data and supporting metadata available in?

5.2 SUPPORTING METHODS

The review team will explore the application of new methods to enhance or replace existing qualitative and quantitative review processes. This exploration will require specialist skill sets to be recruited and/or developed, and for retention of skills in forward planning. Success is contingent on a long-term commitment to continuous improvement with methodology and data science at its core. The right balance of tools, data sources and staff with the skills to analyse them, will ensure that decisions are based on the best and most current evidence, and that urgent updates are prioritised correctly with important longer-term updates also planned.

Examples of analytical approaches that will be explored as part of the ANZSCO maintenance strategy include:

- natural language processing of unstructured data to support identification of groups for review and/or to improve structure
- similarity clustering of groups to identify new structures around emerging occupations (potentially including Sub-Major, Minor and Unit Groups)
- modelling to identify trends in counts of persons to provide near-time insights to support decision-making.

5.3 APPLICATION

The review team will use the framework to assess datasets against each suitability criterion to arrive at an overall determination regarding the suitability of each data source based on that source's specific purpose. This recognises that some data sources will only be suitable for narrow purposes while others will have broader and long-term application.

The framework will be applicable to structured survey and administrative datasets. The team will also explore the framework's effectiveness for assessing unstructured/semi-structured data, such as job advertisement data and sector specific data sources.

6 UPDATE MODEL

The update model is designed to ensure all categories in ANZSCO are reviewed within a five-year cycle, published in time to support adoption by the Census of Population and Housing. The model also will release some updates at higher frequency (annually) to meet the demand for a more responsive and contemporary reflection of the labour market by this classification.

Analyses of labour market trends are usually based on time series at the four-digit (Unit Group) level. In order to preserve these series, changes that are anticipated to require backcasting would be held over for release at the end of the cycle. Not all impacts to time series data will require backcasting in ABS official labour force statistics. Backcasting comes at substantial cost in time and resource and is unsustainable at high frequencies. ABS will endeavour to balance the cost of backcasting with other use cases of ANZSCO, which require near to real-time updates to support policy and program responses to emerging issues within the labour market.

The model proposed below is therefore designed to balance the tension between use case requirements of ANZSCO. For information on the release schedule and dissemination strategy, see Section 10.

6.1 ANNUAL CHANGES

The aim for annual changes is to keep the classification reflective of Australian labour market without disrupting ANZSCO-based time series. If the changes are not able to be implemented by key partners, then ANZSCO's use across government and industry to inform policy formulation and program delivery will reduce. As such, annual changes, will be limited to those that do not affect scope at the Unit Group level or above (defined as 'minor' changes). Allowable changes therefore include:

- text only changes, such as the description of an occupation (at the six-digit level)
- retirement of an occupation (at the six-digit level) provided records that contribute to it will continue to be coded to other occupations in the same Unit Group
- splitting existing occupations, with and without retirement, including 'not elsewhere classified' occupations, provided they remain within the existing Unit Group.

These changes will not impact time series data at the Unit Group level. As a result, most data users would not see any change in their time series or data outputs (apart from improved accuracy) and the cost of implementation in systems and programs will be minimised. It will, however, provide the opportunity to create new six-digit occupations (including from the 'not elsewhere classified' occupations) to meet the need of users, particularly in the areas of education policy and skilled migration. Minor changes would be released annually (see Section 8).

6.2 FIVE-YEARLY CHANGES

Through each of the first four years of the five-year cycle, proposed changes that do not meet the definition of 'minor' would be considered 'major' changes and collated for broad consultation in the fifth year of the update cycle.

Major changes include:

- occupation level changes that are not contained within the Unit Group, such as the creation of *361116 Track Rider* in the 2021 updates that resulted in people reporting 'track rider' being coded to Major Group 3 rather than Major Group 8.
- structural changes to create or retire Major, Sub-Major, Minor and Unit Groups
- conceptual changes to the way groups are formed, including changing the number of skill levels, redefining the skill specialisations that separate Major Groups, or introducing classification-wide changes to enforce consistency (for instance by recognising a middle-management tier across other industry groups based on the 2021 updates to agricultural sector occupations).

The end of cycle major release will be timed to support the five-yearly Census of Population and Housing. Data at the occupation (six-digit) level based on the major update would be made available with the Census second release, occurring in the fourth quarter two years after the classification's release.

Further information is provided in Section 7.1 regarding ABS' implementation of updates to ANZSCO under this new update model followed by Section 8 with a proposed timeline.

6.3 TYPES OF CHANGES

The types of changes permitted under the proposed model of minor/major updates are described in detail in Appendix A. Broadly, changes within Unit Groups will be considered minor because they will have an inconsequential impact on Unit Group counts. As a result, they can be implemented on an annual basis without requiring backcasting for most time series outputs. Changes that affect counts at the Unit Group level or above are considered major. These will be stockpiled and included in the end of cycle major update.

7 IMPLEMENTATION OF UPDATES

7.1 ABS IMPLEMENTATION

ABS collections (Census, Monthly LFS, household surveys) will implement the latest ANZSCO version as soon as practicable. The timing will vary depending on the lead time required for field testing and resourcing to support the backcasting of breaking changes introduced in an end-of-cycle update.

These collections all currently use an index-based coder to automatically and manually code employment question responses. A version of the manual coder is available to external users on request. In conjunction with the comprehensive update, the ABS is developing a new whole-of-government coding solution using a machine learning approach. The solution will be designed to streamline the adoption of updates. The proposed strategy would see the index-based coder updated annually until such time as the machine learning based coder is available for use.

It should be noted that changes to the coding index can impact the time series independently of changes to the classification itself. In particular, changes that correct historical errors and have a measurable effect on counts at the four-digit Unit Group level or above may be regarded as 'major' and be stockpiled for inclusion in the end-of-cycle update of the classification.

Following the ANZSCO maintenance strategy's implementation in 2025, LFS will be the first adopters of both the annual and five-yearly updates. The minimum period to allow for dual coding and validation is expected to be six months. As Table 3 in Section 8 shows, the first three quarters of labour force data each calendar year will be published on the previous year's version. Once LFS have adopted the latest coder, it becomes immediately available for the remainder of the ABS household surveys program. Census will use the latest version available in their field test. This will result in Census slightly lagging behind LFS and household surveys. However, Census will always be enumerated on the latest major update.

7.2 EXTERNAL IMPLEMENTATION

How the updates are implemented by other government agencies, education providers and industry groups is outside the scope of this strategy. However, ABS recognises that moving to an annual review model could impose significant challenges for users who have policy dependencies on ANZSCO. ABS will continue to collaborate with partners and stakeholders to develop supporting material to complement classification releases to aid understanding of changes, including refinement of the suite of concordances provided with every classification update.

8 ABS TIMELINE FOR UPDATES

The five-yearly update cycle will commence once the comprehensive update of ANZSCO is completed and released in December 2024. Table 3 describes the proposed timeline of the review cycle that will be refined based on learnings through the comprehensive update. Please note that the actual release timeline for LFS may vary based on annual benchmarking and modernisation processes yet to be confirmed.

Table 3: Model 5-Year Cycle

		Major Update	Minor Update	Census of Population and Housing	Labour Force Surveys
Calendar Year 1	Q1	Publish Major Change (CY5)			Published on CY4 Classification
	Q2	Consultation - Scoping		Test on CY5 Classification	
	Q3	Review			
	Q4	Stockpile	Consultation – Proposed Updates		
Calendar Year 2	Q1		Publish Minor Changes		Published on CY5 Classification
	Q2	Consultation - Scoping			
	Q3	Review		Enumerate on CY5 Classification	
	Q4	Stockpile	Consultation – Proposed Updates		
Calendar Year 3	Q1		Publish Minor Changes		Published on CY1 Classification
	Q2	Consultation - Scoping			
	Q3	Review			
	Q4	Stockpile	Consultation – Proposed Updates	Published on CY5 Classification	
Calendar Year 4	Q1		Publish Minor Changes		Published on CY2 Classification
	Q2	Consultation - Scoping			
	Q3	Review			
	Q4	Stockpile	Consultation – Proposed Updates		
Calendar Year 5	Q1		Publish Minor Changes		Published on CY3 Classification
	Q2	Consultation - Updates			
	Q3	Review			
	Q4	Consultation - Final Updates			

9 COMMUNICATION AND CONSULTATION

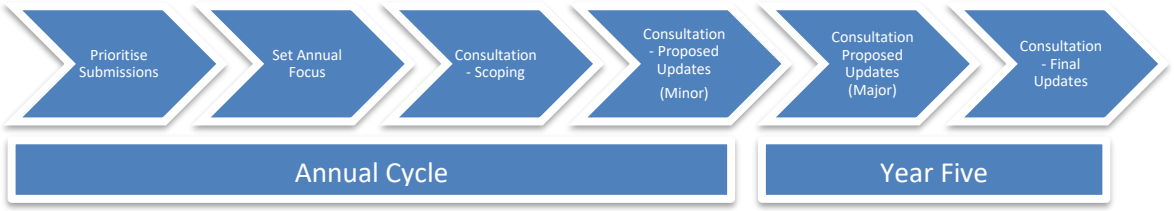
9.1 COMMUNICATION PLAN

The communication plan for the new ANZSCO update model will be informed by experiences in the targeted updates (2021 and 2022) and upcoming comprehensive update. Nonetheless, a key aim of the new maintenance strategy is to be transparent in decision making and to actively engage with users to ensure updates are made to ANZSCO that support diverse policy needs and maintain the integrity of the classification. The ABS will trial a biannual public consultation process through the comprehensive update, enabled through a secure digital service: the ABS Consultation Hub. Each round of public consultation will have a different focus, especially in the fifth year where major changes collated across the previous four years will be presented for feedback. The timing and scope of public consultation will be further refined and made public in early 2025.

9.2 CONSULTATION MODEL

The consultation model proposed to support more frequent updates to ANZSCO is shown in Figure 2.

Figure 2: Consultation Model



Prioritise Submissions and **Set Annual Focus:** ABS will review the priority of submissions and determine the set of focus areas for the upcoming cycle in accordance with the framework set out in Section 4. The schedule of review work (or focus areas for review) will be released annually.

Scoping: A preliminary set of occupations will be developed in partnership with policy and industry leads and confirmed through public consultation process. The focus will be informed by previously prioritised submissions and the need to achieve full coverage of all categories in ANZSCO every five years. While ABS will only be able to implement minor changes in years one to four, submissions regarding possible major changes will be accepted and considered in year five of the cycle. This is intended to reduce provider burden by limiting the number of times we consult on an area of the classification.

Proposed Updates: ABS will seek feedback on proposed changes and any unintended significant impacts. In an annual update year, only minor changes will be presented for feedback. Stockpiled changes will be withheld until the end of the update cycle (year five).

End of Cycle: The fifth year contains two rounds of public consultation. The first round will present the set of stockpiled major changes from the previous four years of consultation. The second round will provide a final opportunity to validate the complete set of changes incorporating the feedback from the earlier round before their release.

The ABS will also undertake targeted stakeholder consultation outside of the public consultation rounds as part of the review team's work to develop proposed changes.

10 DISSEMINATION STRATEGY

10.1 RELEASE STRATEGY

Under the proposed update model, ANZSCO would be released at the beginning of each year. This change in timing is in response to user feedback. The classification would be published on the ANZSCO website along with correspondences to the previous version of ANZSCO and the current version of the International Standard Classification of Occupations (currently ISCO-08). The correspondences would include richer provenance information than is currently provided to reduce the burden on users who, for example, conceptually map ANZSCO codes to education courses. ABS will continue to refine the release documentation to support understanding and implementation by users.

In the fifth year, the end of cycle release process will be the same as the annual releases. As a result, the major update will be developed during year five before being published at the start of the next year (year one of a new cycle). Table 3 (in Section 8) presents the proposed five-year cycle including the implementation of the updates in Census and LFS data (noting the actual timing of release may vary subject to annual benchmarking and modernisations processes).

To illustrate what this would look like after the comprehensive update ends in 2024, the first annual update (for calendar year one) will occur in late 2025, then three more annual updates will occur until the first major update under the proposed strategy is released at the beginning of 2030.

10.2 PRODUCTS

The products released on an annual basis under the maintenance strategy will include:

- updates to the ABS website to reflect the updated version of the classification
- updates to the current ANZSCO coder (noting this will be superseded by a whole-of-government coding solution due to be delivered by the end of 2024)
- provenance information including sufficient explanation of the rationale for the change to support interpretation
- correspondences to the previous version of ANZSCO and the current version of ISCO
- when applicable, updates to the conceptual underpinnings of the classification as outlined on the ABS website.

11 GOVERNANCE AND QUALITY ASSURANCE

11.1 GOVERNANCE

The details of the governance structure designed to manage the risks introduced through a targeted maintenance model will be refined by the experiences of the comprehensive update commencing in 2022.

As an official statistical classification, authority to approve updates sits with the Australian Statistician, which in this case has been delegated to the custodian within the ABS. To support decision making regarding changes, the custodian will use the insight and advice of reference groups formed from a panel of expert users and policy/program delivery areas.

The custodian will rely on additional processes including the Independent Review Panel (classification and user experts) to quality assure changes being proposed.

11.2 DECISION TREES

Decision trees are the primary tool used by the ANZSCO review team to ensure the quality and consistency of updates. They require the review team to determine whether changes would violate the core requirement of exclusivity between groups. In addition, by introducing a minimum count threshold, decisions trees ensure that ABS can produce reliable national estimates at the four-digit Unit Group level in LFS tables. These tools underpin the update model by increasing the objectivity of the review process and consistency of decision making.

11.3 PRINCIPLES OF CLASSIFICATIONS

The principles of statistical classifications will continue to guide maintenance of ANZSCO, regardless of the increased frequency and targeted scope of updates. Adherence to these principles is essential to maintaining the relevance of ANZSCO as Australia's standard for classifying occupations.

These principles require that ANZSCO be owned, helpful, representative, well structured, clearly defined, comparable and robust.

These principles are described in detail in Appendix B.

12 CONCLUSION

This paper has outlined a new update model to maintain ANZSCO in a way that balances maintaining robustness/stability of time series data with the need to reflect contemporary changes to the labour market in a timely manner. The model defines minor updates to be made annually, and major updates to be released every five years in time to support adoption by the Census of Population and Housing.

As noted throughout the paper, the details of this new model reflect current thinking informed through the targeted reviews of ANZSCO during 2021 and 2022 and dedicated use case workshops. Following completion of the comprehensive update to ANZSCO in December 2024, this update model will be revised and published on the ABS website.

We value your feedback on this new approach and would appreciate you taking the time to answer the questions posted on the ABS Consultation Hub. If you have any queries regarding the content of this paper and the update model proposed, please contact us by emailing anzsco.maintenance@abs.gov.au

APPENDIX A – TYPES OF CHANGES

Occupations: Are the building blocks of ANZSCO. All ABS unit record data and data from many other organisations is coded at the six-digit occupation level.

There are many types of changes that can occur at the occupation level:

- **Retired** – where an occupation is no longer able to describe a sufficient number of employed persons it may be retired, and the code discontinued. The few workers remaining would be coded to other relevant occupations, likely in a 'Not Elsewhere Classified' occupation group. This is done to ensure a manageable, balanced classification.
- **Created** – where an occupation category is sufficiently significant and warrants separate identification within ANZSCO, including new/emerging occupations. This change may have a major impact on the time series and require backcasting where the change crosses Unit Groups.
- **Split, retiring the original code** – occupations may be split into one or more new categories that remain within the existing Unit Group. This meets demand for increased detail/granularity within the occupation set but does not impact the Unit Group level.
- **Split, without retiring the original code** – occupations are created within the same Unit Group. Units previously coded to the existing occupation are now coded into new occupations within the same Unit Group. This change may occur to stand up a specialisation of an existing occupation as a new, separately identified occupation. At the Unit Group level there should be no impact but obviously a break in series for the occupation level.
- **Moved between Unit Groups** – occupations that do not have substantial conceptual change but have changed codes and Unit Groups due to constraints on the number of codes that can fit within a given Unit Group. These changes are enacted to preserve statistical balance and integrity of the classification. These changes are likely to have a substantial impact on time series data at the Unit Group level but no impact (apart from a change in code) at the occupation level.
- **Created from 'Not Elsewhere Classified'** – Occupations split from a 'not elsewhere classified' category is like a standard occupation split. NEC occupation categories are often where emerging occupations will be coded and can grow substantially larger by count of workers than other groups. Because they are 'residual' categories, they are often less specific, less homogenic and harder to describe. As such they are often excluded from the skilled visa program and many users exclude these categories from their time series analyses.

Unit Group: These are the building blocks for most time series data. Detailed data is rarely published below the Unit Group level. The most restrictive requirement for minor annual updates is for there to be no changes to Unit Groups or impact to Unit Group time series data.

Minor Group: The 2021 update saw the creation of three new Minor Groups that impacted the time series data for other Minor Groups as a consequence of occupations shifting between Minor Groups and new occupations.

Sub-Major and Major Groups: While it is unlikely that the ABS will create or remove a Sub-Major or Major Group, changes to contributing categories at the Minor or Unit Group level can impact the time series data for these groups (for example, the evolution of skill level requirements for some occupations may require the re-categorisation of those occupations to alternative Major/Sub-Major groups. This is due to the structural alignment of Major Groups to skill levels).

Text Only Changes: Text-only changes refer to changes in the descriptions of Major Groups, Sub-Major Groups, Minor Groups, Unit Groups and occupations and to selected attributes, for example tasks, specialisations, titles and alternative titles. If not related to other changes, the primary purpose of textual change is to improve visibility of occupations and utility of the classification.

Skill Level Changes: Occupations are constrained by conceptual definition to a skill level. Where it is deemed that an occupation set contains jobs requiring a different skill level, a new occupation (and code) would be stood up. This may result in the retirement of the existing code if the change leaves an insufficient number of records behind.

APPENDIX B – PRINCIPLES OF STATISTICAL CLASSIFICATIONS

Statistical classifications are ordered sets of related, mutually exclusive categories which should not exist in isolation from a supporting statistical standard. Statistical classifications allow data to be presented in a standard way by ordering data for specific subject matter needs, thereby enabling data coherence across statistical collections.

Owned:
- Has a custodian
- Stakeholders have been documented and consulted with
- Has a maintenance schedule

Helpful for statistical analysis:
- Meets statistical user needs
- Has been tested
- Allows for output that conforms to the ABS's mission statement of accurate, reliable, relevant, and timely
- Supports output of meaningful data for analysis
- Results allow for extrapolation

Representative:
- Current and relevant
- Provides a basis for explanations
- As inclusive as possible of the units intended to be observed under the concept
- Does not skew sample results
- As statistically balanced as possible, - categories at the same level are similar in size

Well structured:
- Flat or hierarchical
- Arranged logically and sequentially
- The classification is exhaustive of the units it is intended to cover.
- Mutually exclusive categories at the same level are clearly defined and do not overlap with each other.
- Uses a consistent conceptual basis
- Can be used in the collection, production, and presentation of statistics
- Uses numeric and/or alpha code identifiers

Clearly defined:
- Scope, conceptual basis, and objectives are documented
- Category names are precise, unique, and reflective of the category scope
- Definitions are clear and unambiguous
- Units being measured are defined
- Uses standard international and/or ABS definitions where appropriate
- All documentation relevant to the classification are consistent
- Content of each category in the classification is clearly defined

Comparable:
- Promotes international and national comparability or harmonization
- Correspondence to similar international and domestic classifications are available if applicable
- Comparable over time – maintains time series
- Comparable across collections

Robust:
- Practicable - can be easily implemented in the real world
- Will be relevant for a period of time
- Can be used in a variety of applications
- Meets the needs of data collections, analysis, and dissemination simultaneously

For a more detailed discussion on the principles and best practices for statistical classifications, see 'Best practice guidelines for developing international statistical classifications'.