Australian Government

**Department of Employment,
Skills, Small and Family Business**

Review of the Australian Apprenticeships National Skills Needs List

Methodology Discussion Paper

December 2019

Contents

1. Introduction

In the 2019-20 Budget the Government announced it would comprehensively review the National Skills Needs List, in consultation with industry and employer groups, to ensure it remains relevant to changing labour market demand.

The Review is being conducted by the Department of Employment, Skills, Small and Family Business (Department) with a view to advising the Government on the methodology and inaugural composition of the replacement list. Thereafter the National Skills Commission will assume responsibility for maintaining and updating the skills shortage methodology and advising the Government on the future composition of the list, in tandem with its role in forecasting labour market demand for skills.

The central focus of the review is the methodology with which occupations in skills need are identified and prioritised for the purpose of targeting apprenticeships incentives and payments.

The key objectives of the review include:

- to ensure the National Skills Needs List is fit for purpose and responsive to changing labour market conditions;
- to develop an integrated approach to identifying occupations in skills shortage to effectively target employer apprenticeship incentives and apprentice payments; and
- to contribute to a coherent policy approach to identifying and addressing skills shortages across government.

Consultation Process

An Issues Paper outlining six principles for the design of a new methodology was released on 29 August 2019. The submission period for the Issues Paper closed on 27 September 2019.

There was broad support for the six design principles and agreement about the deficiencies with the current National Skills Needs List methodology. The Department is now seeking submissions from industry and employer groups, and other interested stakeholders on the methodology outlined in this paper to realise those principles.

The methodology proposed by the Department would involve some changes to the policy underpinning the Incentives for Australian Apprenticeships program. Any policy changes would be a matter for Government.

In response to the feedback received on the Issues Paper a further round of consultation is to be held in February as part of the process toward settling the initial list of eligible occupations.

The broad timeline for the remaining stages of the Review is set out below:

Consultation Stage	Approximate Timing
Release of Policy Discussion Paper - methodology	11 December
Consultation with industry and other stakeholders	December
Close of Submissions	31 January
Release of occupation Traffic Light report	February
Consultation with industry and other stakeholders	February/March
Release of draft Guidelines for new Incentives for Australian Apprenticeships program, including the revised NSNL	May 2020

How to make a submission

Interested parties are invited to make a submission on the issues raised in this Discussion Paper using the online submission form by 31 January 2020. If you do not wish to use the online submission form please refer to the Department's submission guidelines.

Electronic lodgement of submissions is preferred. If you are unable to submit your response electronically, please contact the Director, Apprenticeships Framework Policy via the email address below.

Closing date for submissions: 31 January 2020

Email: nsnlreview@employment.gov.au

Providing a confidential response

It is the Department's intention to publish non-confidential submissions on the Department website after the closing date for submissions has passed.

If you would like all or part of your submission to remain confidential, you should indicate this at the time of lodging your submission together with reasons as to why you are requesting that the information be accepted on a confidential basis. Automatically generated confidentiality statements in emails do not suffice for this purpose.

If you would like part of your submission to remain confidential please provide a version that 'blacks out' or specifically identifies the confidential information, as well as a complete version.

A request made under the Freedom of Information Act 1982 (Cth) to have access to submissions marked 'confidential' will be determined in accordance with that Act.

2. Feedback on the Issues Paper

Consultation response

The Department received 48 submissions in response to the Issues Paper. Of these, 20 were provided through the Submission Form on the NSNL Review webpage and 28 were provided as free-form submissions.

Industry associations and employers contributed 37 of the 48 submissions. Other contributors included a small number of Group Training Organisations, Registered Training Organisations, government agencies and individual contributors.

The submissions covered a diverse range of occupations, including industrial, building and motor trades, agricultural trades, technology and ICT, the service sector, childcare and some specialty trades.

There was broadly equal representation by respondents identifying as being in a major urban centre and those in a rural or regional area.

Key messages

Three-quarters of respondents agree or strongly agree with the identified deficiencies in the National Skills Needs List (NSNL) as it currently operates. Common responses regarding the limitations of the current methodology were in respect of the Survey of Employers who have Recently Advertised, the lack of recognition of small and emerging occupations and the lack of recognition of regional skills shortages.

There is broad support for the six design principles articulated in the Issues Paper (Table 1)[1]. The lowest agreement percentage is for a single coherent approach to identifying occupational skills shortages (approximately two-thirds). This seems to reflect a concern that a single approach might discriminate against some occupations or be too slow to respond to emerging developments. There also appears to have been a misunderstanding by some respondents that a single coherent approach would apply to eligibility for the full range of incentives under the Australian Apprenticeships Incentives Program, not just those targeted toward addressing skills shortages through the NSNL, AISS Payment and Priority Occupations.

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[1] Refer to Appendix A for a summary of the six design principles.

Table 1: Response ratings for the six design principles (a)

Principle	Agree	Neutral	Disagree
Single coherent methodology	65%	5%	30%
Forward looking	85%	10%	5%
Responsive to skill shortages	90%	5%	5%
Transparent yet flexible	90%	5%	5%
Support informed decision making	90%	5%	5%
Prioritise economic & social benefit	80%	5%	15%

(a)   Response rates are based on the online Submission Form responses adjusted to include other submission responses.

A proportion of submissions identify alternative or additional principles to those in the Issues Paper. A common theme is to include consultation with industry as a design principle.

The three design principles considered to be of highest priority are:

1. Forward looking;
2. Responsive to changes in skill shortages; and
3. Prioritise outcomes that deliver the greatest economic and social benefit.

Responses against each principle

A Single coherent methodology

There is broad support for a methodology that does not preclude occupations by design. A number of submissions drew attention to the significant role played by the Department's Skills Shortage Research Methodology in limiting the occupational scope of the NSNL.

Support for a single coherent methodology to identify occupations in skills shortage is in the context of targeting apprenticeship incentives in some submissions but in others it extends to one methodology to underpin both apprenticeship incentives and skilled migration.

For those respondents who do not support a single coherent approach, the primary concern appears to be that it might lack the flexibility to deal with individual situations, including:

- small occupations that are not supported by public data;
- emerging occupations;
- regional or segment specific skill shortages; and
- changing circumstances in an occupation.

Concerns were raised about continuing to use the Australian and New Zealand Standard Classification of Occupations (ANZSCO) as the foundation of any occupational analysis. Concerns included that the ANZSCO is not well aligned with current occupational roles and poor recognition of new and emerging occupations. Other submissions favoured shifting the primary focus from occupations to qualifications or, in the context of rapidly evolving work roles, to shortages in specific skill sets rather than complete qualifications.

A forward looking approach

There is strong support among stakeholders for moving to a forward-looking assessment of whether occupations are in skills shortage.

A range of views were provided about the appropriate timeframe over which the forward assessment should be made. Central to the range of timeframes is a period of around three to six years. The primary reasons given for such a timeframe are the length of an apprenticeship and the need to strike a balance between longer-term industry trends and shorter-term skills fluctuations.

Submissions favouring a shorter timeframe drew attention to the difficulties in predicting future outcomes, the need to be responsive to changing circumstances and the rapid pace of change in the skill sets required in occupational roles.

Several submissions proposed longer timeframes, citing the need to anticipate industry cycles, the time it takes to build a trained workforce to meet future workforce demands and the lags in developing the training products required to meet future workforce skills needs.

There is broad support for a forward looking methodology framed around the four pillars outlined in the Issues Paper:

- an understanding of the current state of the skilled worker demand/supply balance in each occupation;
- an understanding of the future demand for skilled workers in each occupation, which takes into account projected growth in the economy and changes in its composition (growth demand);
- an understanding of the potential attrition of existing skilled workers (replacement demand) in each occupation over the projection period, occurring through retirement, occupational or role changes of existing workers, or for other reasons; and
- an understanding of the potential contribution of skilled workers to each occupation over the projection period through completion of apprenticeships, completion of other qualifications or through other pathways.

While few respondents disagree with this approach, a larger proportion drew attention to the limitations in attempting to quantify future skills needs. The main concerns noted by respondents in applying this approach are:

- that anticipating future outcomes is prone to error due to unforeseen events;

- the limitations in the data available to support such an analysis;
- the changing nature of the labour market makes it difficult to predict future outcomes using traditional labour market metrics; and
- it will be necessary to revisit the methodology from time to time to maintain its currency.

Notwithstanding their support for a quantitative methodology, the majority of respondents emphasised the need for consultation with industry to assure, augment and refine the results obtained under a quantitative approach and to ensure the methodology remains attuned to developments in industry and the workforce. It is seen as an important reality check on the outcomes of using a projections-based modelling approach to identify skill shortages.

Industry consultation is seen as being particularly important in dealing with the perceived limitations of the ANZSCO, including for niche and emerging occupations, and in understanding disparities within an occupation, either geographically or in terms of the job roles performed.

Suggestions for ensuring a degree of objectivity in industry input include to:

- design a standardised survey instrument that associations can issue to their members for collecting information;
- seek input from Australian Apprenticeship Support Network Providers, Registered Training Organisations and Group Training Organisations that have a broad occupational base;
- analyse job search data to identify niche and emerging occupations; and
- use skilled migration data as an indicator of skill shortages.

Responsive to skill shortages

There is majority support among stakeholders for the skills shortage methodology and list of eligible occupations to be updated on a regular basis and, specifically, with an annual frequency.

Comments provided in submissions suggest there was ambiguity about what was meant by updating the methodology on an annual basis, with some respondents reading this question to imply the methodology itself would be updated annually and others reading it to imply the methodology would be applied annually as part of an annual assessment process. The question was framed in the Issues Paper with the latter interpretation and greater clarity may have resulted in less disagreement.

The burden on industry of consultation is a key reason some respondents are not supportive of applying the methodology on an annual basis. In contrast, a few respondents suggest the review process should be more dynamic than would be the case under an annual review process but that any changes should be incremental.

The key reasons for disagreeing with updating the skills shortage list on an annual basis are the potential disruption to workforce planning if an occupation could be listed for as little as one year at a time and difficulties in tracking entitlements of employers and apprentices in a workplace.

Transparent yet flexible

Stakeholder responses were evenly balanced in terms of their preference for giving greater relative weight to transparency or flexibility in the design of the new methodology. Transparency is considered important for participants to have trust in the system. Flexibility is seen as important in being able to respond to the circumstances of different occupations, particularly in the context of a single coherent methodology. The concept of risk guidelines was raised in several submissions as a way to deliver a degree of transparency around qualitative assessments of eligibility.

A common theme in submissions is the need to engage industry to deliver outcomes that are consistent with the needs of industry. Some respondents were of the view that transparency will follow if industry consultation is done well.

Support informed decision making

Stakeholders are in broad agreement that incentives will be most effective when there is clarity and certainty about eligibility. Consistent with this view, there is broad support for eligibility for incentives to be linked to the commencement of an apprentice and locked-in for the duration of the apprenticeship. There is also a general view that volatility in eligibility should be minimised, with a number of respondents pointing to timeframes of more than 12 months for businesses to respond to incentives and invest in skill formation.

There is a spread of views about the amount of lead time that is required between the skills shortage list being announced and when it comes into effect, from less than 3 months through to more than 12 months. More than half of respondents indicated a period of less than 6 months. A number of respondents indicated the need to publicise the lists in advance of the main hiring period. The main reason given for the longer lead times is to give businesses ample time to respond to the incentives.

Prioritise economic and social benefit

There is broad support among stakeholders for targeting apprenticeship incentives where they are likely to deliver the greatest economic and social benefit, but a diversity of views as to how that benefit should be determined. Several submissions called for the development of metrics to demonstrate the relative economic and social benefit of providing incentives to different occupations. A small number of submissions did not agree with this principle.

The majority of respondents agree with the concept of targeting incentives to occupations for which an apprenticeship is a primary entry pathway. This was strongest among respondents in occupations where the apprenticeship is the main entry pathway. In contrast, some respondents argued that restricting access to incentives based on an apprenticeship being the primary pathway could contribute to reduced apprenticeship participation in industries already affected by

downward trends in apprenticeship numbers, or preclude the expansion of apprenticeships where they are not traditionally used.

There was support for apprenticeship incentives being targeted at commencing additional apprentices, though it is unclear how respondents interpreted the meaning of an additional apprentice. There was also support for directing incentives toward occupations that deliver the strongest response effect to the incentive.

Respondents offered a range of other criteria that might be used to target skills shortage incentives, among these are:

- the ratio of qualified to non-qualified practitioners in an apprenticeship-based trade, the focus being on maintaining the base of skilled practitioners (who are the future trainers);
- small businesses and other employers who face cash flow constraints;
- supporting apprenticeship completion rates;
- supporting diversity in the skilled workforce;
- targeting industries with an ageing apprenticeship-trained workforce; and
- targeting occupations that significantly impact other occupations in the supply chain.

There was broad support for undertaking occupational analysis to support the delivery of apprenticeship incentives and a range of indicators and metrics have been proposed to support this process.

3. A Proposed Skills Shortage Methodology

The methodology the Department is proposing to assess skills shortages for the purpose of targeting apprenticeship incentives draws together the design elements canvassed in the Issues Paper and the feedback received through the submission process, as well as discussions with stakeholders through the VET Stakeholder Committee and skilled migration consultation process.

- Appendix B contains a short discussion of some of the design proposals raised in submissions that have not been incorporated into this methodology.

A broad skills-shortage methodology

The proposed approach is to utilise one underlying skills shortage methodology that can be applied across all occupations, including those for which apprenticeships are not currently an entry pathway. This will provide a durable approach to skills shortage analysis in the context of changing work roles. The new methodology would be used to identify occupations to be included in a single apprenticeships skills shortage list, a subset of which would be eligible for the AISS Payment. The list would also provide the basis for identifying occupations for which apprentices would be eligible to apply for a Trade Support Loan. The steps in the methodology are summarised in Table 2.

The two key components of this methodology are:

1. a forward-looking data driven analysis of the projected net skills position in an occupation four to five years hence; and
2. targeted industry consultation on the findings of that analysis, informed by a Traffic Light Report on the status of each occupation.

It is not practical to move away from the ANZSCO as the basis of classification in the replacement skills shortage methodology. This is because the ANZSCO underpins the structure of the current apprenticeship system and many of the recognised data sets available to support a forward-looking approach to identifying occupational skills shortages.

Industry consultation will provide a means to address some of the shortcomings in the ANZSCO and the forecasting process, as well as to provide a potentially more granular occupational view of skills supply and demand. The challenge is to bring a degree of objectivity and rigor to stakeholder input. To balance the costs and benefits of consultation, it is proposed that the consultation process be targeted through a Traffic Light approach identifying those occupations for which skills-shortage listing is open to consideration, similar to the approach for updating the skilled migration lists.

Consistent with the preference expressed in submissions, it is proposed that assessments be conducted on an annual basis. Annual skill shortage assessments will not only ensure the skills shortage list is responsive to changes in labour market conditions, it will ensure assessments adjust

quickly as new information comes to light about the current and projected state of the labour market through data revisions.

The skills shortage list and those occupations eligible for the AISS Payment are proposed to be announced around the time of the May Federal Budget and take effect from 1 July of the following financial year. This timing would provide a six month lead time to the main hiring period and minimise distortions to hiring behaviour. An option to ensure a degree of stability in eligibility for skills shortage incentives, would be for occupations to be eligible for those incentives in a year they first cease to be on the skills shortage list. Consistent with current policy settings, AISS incentives would only apply to apprenticeships commenced during a year in which an occupation is listed as being eligible for the AISS Payment.

Table 2: Steps in the proposed skills shortage methodology

| Step	Description
Step 1	Undertake quantitative skills demand analysis for all ANZSCO occupations.
Step 2	Apply filters to narrow the set of skill shortage occupations identified in Step 1 to those for which apprenticeships represent a significant entry pathway or which meet other selection criteria OR are identified as a priority occupation.
Step 3	Publish a Traffic Light indicator of the stratified occupations (Step 2) which identifies three categories: **Green**: Occupations with an estimated skills shortage above an upper threshold or that are otherwise assessed as meeting the criteria for inclusion. **Orange**: Occupations with an estimated skills shortage between the Green and Red thresholds, occupations that are not subject to quantitative analysis and occupations that could cease to be on the skills shortage list in that year. **Red**: Occupations with an estimated skills shortage below a lower threshold or that are otherwise assessed as not meeting the criteria for inclusion.
Step 4	Invite industry submissions and undertake consultation on the status of occupations in the orange category and occupations which industry considers should be given further consideration for inclusion.
Step 5	Announce the final occupational composition of the skills shortage list, the occupations eligible for the AISS Payment and the underpinning qualifications eligible to attract the associated incentives.

A quantitative five-year skills forecast model

The proposed approach to a data driven analysis of projected net skills positions is to derive an estimate of the shortfall in the supply of apprenticeship-trained workers for each occupation.

A defining parameter for the forecast horizon is the availability of a reliable prediction of future skills needs. It is proposed to anchor the forecast horizon for the analysis using the Department's five-year employment projections. In practice, the lead time will be around four years from the time the skills shortage apprenticeship incentives come into effect, on 1 July the following year.

Figure 1 and Table 3 summarise the estimation process and data sources.

Figure 1: Schema of a forward looking skills shortage analysis
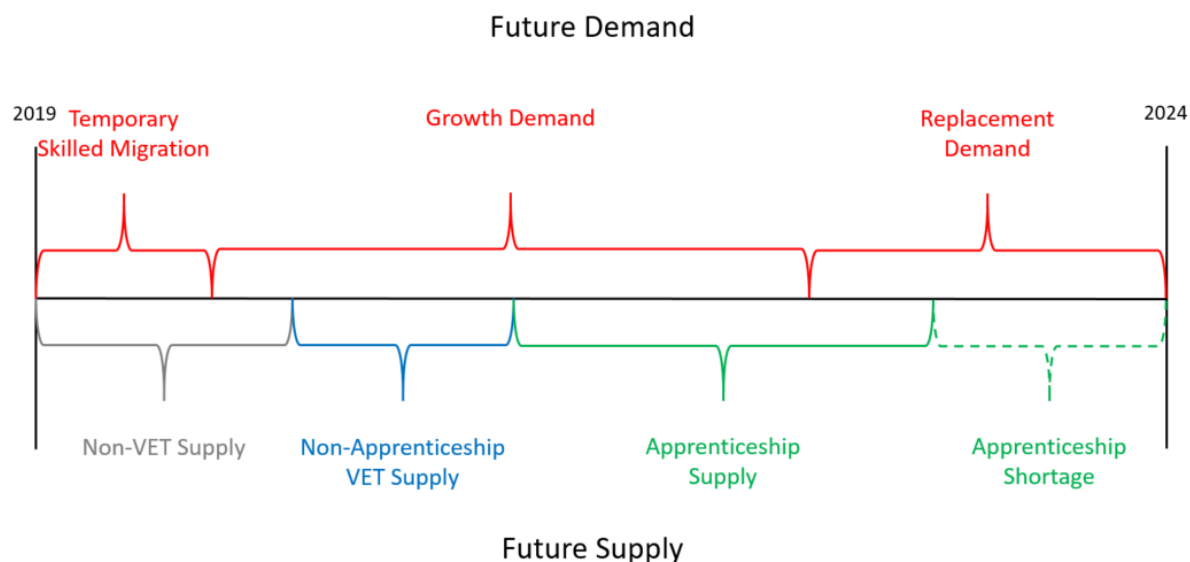
The top half of Figure 1 represents the calculation of the demand for additional future workers in an occupation. The total demand is comprised of three components:

- the portion of any current skill gap filled through temporary skilled migration;
- the difference between the projected and current workforce; and
- workers who will permanently leave the occupation over the projection period – for example, due to career progression and age retirement.

The bottom half of Figure 1 represents the composition of the supply of the required workers. The total supply is comprised of four components:

- non-vocational education trained entrants;
- vocational education trained entrants not pursuing an apprenticeship pathway;
- apprenticeship-trained entrants; and
- any shortfall in the future supply of apprenticeship-trained entrants.

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Table 3: A forward looking occupational skills shortage analysis (a)

Model component	Purpose and potential data source
Future employment demand	Estimate the potential occupational workforce four to five years hence. *Source: Departmental five-year labour market projections by occupation*
less Current employment	Subtract current employment to identify the demand for additional positions over the forecast horizon. *Source: ABS Labour Force by Occupation (May)*
plus Replacement demand	Increase the estimate of demand for additional positions for workers who will move out of the occupation on a permanent basis. *Source: Future job openings for new entrants by industry and occupation, NCVER (2018)*
plus Temporary skilled migration	Add back current employment met through temporary skilled migration to identify the underlying additional positions requirement. *Source: https://data.gov.au/dataset/ds-dga-2515b21d-0dba-4810-afd4-ac8dd92e873e/details*
less Entry by a non-apprenticeship pathway	Reduce the estimated demand for additional positions by an estimate of entry through a non-apprenticeship pathway. *Source: Internal analysis of ABS Census data to determine the proportion of positions supplied through a VET pathway and of TYIMS/NCVER/VET data to derive the proportion of VET training undertaken through an apprenticeship pathway.*
less Apprenticeship entrants	Reduce the estimated demand for additional positions by anticipated apprenticeship completions. *Source: TYIMS apprenticeship commencement data projected to the end of the projection period, adjusted for completion rates.*
equals Apprenticeship skills shortage	The net result is an estimate of the projected shortfall or surplus of apprenticeship-trained workers in each occupation.

(a)   This model assumes in-training numbers are the same in the base period and the future period.

The first two elements of the supply of workers are determined by applying proportional parameters derived from the 2016 Census and from Training and Youth Internet Management System (TYIMS)/National Centre for Vocational Education Research (NCVER)/Vocational Education and Training (VET) activity data to the future demand for workers. Implicit in this approach is an assumption that the proportion of non-VET trained workers in the future demand for workers will be the same as that in the existing workforce. Similarly, it is assumed that the proportion of VET trained workers engaged through an apprenticeship will be the same in the future as is evident in enrolments in 2018.

Further detail on each of the variables in the quantitative analysis is provided in Appendix C.

Analysis at the ANZSCO four-digit occupational classification

The Department's employment projections and most of the other data sets required to perform the quantitative skills shortage assessment are available for ANZSCO occupations defined at the Unit Group (four-digit) level. This defines the level at which the analysis can be performed.

Performing the quantitative analysis at the four-digit level means there is obscurity about the existence and intensity of skills shortages among the six-digit occupations that comprise the four-digit occupational classification. For example, within the four-digit classification 3341-Plumbers there are five six-digit occupational classifications – namely, 334111-Plumber (General), 334112-Airconditioning and Mechanical Services Plumber, 334113-Drainer, 334114-Gasfitter and 334115-Roof Plumber. The analysis provides no insight into the extent of skills shortages at this more detailed level.

The working assumption for the analysis is to apply the four-digit skills shortage finding proportionally across each of the six-digit occupations comprising each four-digit classification. It is not proposed to extend this default treatment to Not Elsewhere Classified and Not Further Defined subcategories. However, where other information can be brought to bear regarding the applicability of the four-digit analysis at the six-digit level, that information may result in the partial inclusion of occupations comprising the four-digit classification. For example, one potential source of information is the Department's Skills Shortage Research. Where there is evidence of past skills shortages in only some six-digit occupational categories, those occupations not indicating any evidence of past skill shortage may be excluded. Stakeholder consultation will provide further insight.

Data issues and considerations

The reliability of this approach depends critically upon the availability and reliability of the data that underpins it. It is generally accepted in submission responses that the forward looking skill shortage projections will be subject to a degree of forecast inaccuracy, due to limitations in the data underlying the projections, limitations in our understanding of how the labour market is evolving and the future influence of unforeseen events. Nevertheless, there is strong support for

anchoring the skills shortage assessment in a quantitative approach that is complemented with insights from industry consultation.

Each of the datasets used to calculate these variables is subject to a degree of inaccuracy. It is proposed to deal with the inherent data reliability issues by:

- Progressively updating the analysis on an annual basis so that the skill shortage projections are responsive to changes in the information set available to labour market analysts;
- Setting thresholds for the existence of a skill shortage in the quantitative analysis that acknowledge the potential inaccuracies in the modelling methodology;
- Undertaking industry consultation to qualify and assure the modelling results; and
- Applying eligibility settings that smooth potential volatility in skill shortage assessments.

Augmenting modelled outcomes through consultation

Notwithstanding the detailed level at which the skills shortage modelling is applied, the results obtained from the modelling cannot necessarily be accepted at face value. For example, the data upon which the modelling is performed may mask complex underlying relationships relevant to the assessment of whether a skills shortage exist. This theme comes through the submission responses, with a clear call for industry engagement as part of the process.

Consultation with industry is one means through which some of the shortcomings in the modelling results may be addressed. Another important means will be through the application of secondary information and informed judgement. These processes are necessary to achieve high quality outcomes, but they have the consequential effect of reducing the overall transparency of the process.

Targeted consultation

In order to maintain a high level of transparency and balance the call on industry and departmental resources to be engaged in an annual consultation process, it is proposed that consultation on the skills shortage list be undertaken in a targeted manner.

This is proposed to be achieved by filtering the quantitative skills shortage analysis to identify occupations that meet the necessary conditions for listing.

It is proposed that the future skills balance of each ANZSCO occupation be assessed and categorised as follows:

- in skills shortage if the estimated future skills deficit exceeds a threshold;
- in skills surplus if the estimated future skills surplus exceeds a threshold;
- under review if the estimated future skills balance is within the deficit/surplus thresholds.

The skills deficit and surplus thresholds used for the categorisation process would be set conservatively in light of the potential inaccuracies in the skills forecasting methodology.

It is proposed that a traffic light approach be adopted similar to that used for the skilled migration process as a means to focus industry consultation. Occupations would be identified as falling into one of three categories. Occupations in the first category would be rated green and placed on the skills shortage list without the need for industry consultation. Occupations in the second category would be rated red and excluded from the skills shortage list. Occupations in the third category (orange) would be flagged for consultation with industry to better understand the skills balance and the role incentives would play in addressing the skills balance.

The consultation process would also provide an opportunity for representations to be made in respect of any other occupational needs not considered under the initial analysis. Occupations for which the quantitative analysis cannot be undertaken would be included in the orange category, unless prior occupational analysis indicated otherwise. While submissions would not be sought on those occupations not in the orange category, any additional submissions would be accepted and considered as part of the process of settling the final list.

Informed economic and policy judgement

The final composition of the skills shortage list would take into consideration evidence provided by stakeholders through the consultation process together with the results of the quantitative skills shortage assessment and any occupational analysis undertaken within the Department or by the National Skills Commission.

Submissions providing robust evidence of a national skills shortage would be expected to receive greater weight than those with qualitative evidence or argument. This would be of particular significance where the argument for inclusion is related to the role of apprentice-trained workers in occupations with a high proportion of entry by a non-apprenticeship pathway.

Distilling the final composition of the list from this set of information will necessarily rely on the informed economic and policy judgement of decision makers. At the margin, this could involve judgements about the relative economic and social benefits that might be expected to arise through supporting one occupation over another.

Design features to support certainty

Consistent with the majority view of respondents, the proposed approach is to continue to link eligibility for skills shortage incentives that accrue over the life of the apprenticeship to the skills shortage status of the apprenticeship at the time of commencement. This approach will support informed decision making by providing certainty of entitlement to the employer and apprentice, subject to eligibility conditions being met.

It is proposed that the list be announced in May of each year as part of, or following, the annual Federal Budget. The list would take effect as of 1 July in the same year. This timing:

- fits comfortably within the annual data cycle;

- allows for industry engagement on a draft occupation list;
- provides a good lead time for business to assess their hiring intentions ahead of the peak apprenticeship period; and
- minimises unintended distortions to hiring intentions because the announcement is during a period of less active apprentice engagement and has a short lead time to when it takes effect.

Given limitations in the data driven demand modelling and the proposed annual review process, consideration could be given to an option that when an occupation is included on the skills shortage list, employers and their apprentices remain eligible for the skills shortage incentives for one year after the occupation ceases to be included on the list. This could reduce the occurrence of any excessive volatility in an occupation being included on the list in any one year, providing clearer signals to employers and their apprentices about the available incentives. This treatment would not apply for eligibility for the AISS Payment.

Prioritising economic and social benefit

In addition to being generally supportive of the proposed criteria outlined in the corresponding section of the Issues Paper, submissions raised a number of other criteria for assigning priority to the allocation of apprenticeship incentives.

One common theme in responses is the need to raise the completion rate to improve the return to vocational investment and training. For example, several submissions pointed to incentive structures that encourage continued engagement, such as through progressive payments that are weighted toward the latter part of an apprenticeship. Changing the structure of existing apprenticeship incentives is outside the scope of this review.

A range of the proposed criteria were aimed at addressing particular target groups, such as increasing the participation of women in an occupation, increasing diversity more generally or providing greater support to small businesses to take on apprentices. These objectives are better addressed through targeted incentives, where considered effective and worthwhile, such as those that apply to support people from disadvantaged backgrounds.

Another strong theme in the feedback is the need to look at skill shortages through a geographic lens, not just at an aggregate or national level. This issue is also better addressed through a targeted incentive, where considered effective and worthwhile. In this case, there is also a question about whether State and Territory governments are best placed to assess need and deliver an incentive if the occupation is not skills shortage listed at a national level. Federal funding from the Skilling Australian Fund is provided to participating States and Territories to assist in addressing their skills needs.

The criteria discussed below are intended to apply as generic filters for the purpose of being listed on the replacement Australian Apprenticeships skills shortage list.

Future skills shortage

Moving to a forward looking skills shortage methodology is intended to shift the focus of skills-shortage incentives to addressing projected skill shortages, consistent with the timeframe required to train an apprentice. Occupations would be required to be in projected skills shortage to be eligible for listing.

Evidence of a current skills shortage will not be a sufficient condition for inclusion on the skills shortage list if there is not expected to be a future skills shortage. Evidence of a current skills shortage, but not a future skills shortage, could suggest there is sufficient existing incentive for employers to commence apprentices as one means to help meet their short term workforce needs.

Apprenticeship a significant pathway

As noted in the Issues Paper, applying a broad methodology for the purpose of allocating apprenticeship incentives requires filters or criteria to focus the occupational scope of the underlying methodology on its intended objective. At the most general level it is proposed that occupations be required to meet a test that apprenticeships are a significant pathway for entry to the occupation.

The significant pathway requirement is in part designed to prioritise incentives toward those occupations where other entry pathways are limited and in part designed to deliver an acceptable level of efficiency from the provision of incentives. The efficiency concern with providing incentives in occupations where an apprenticeship is not a significant pathway is that there could be a large substitution effect between apprenticeship–based training and other forms of training in response to the incentive, with no effective increase in the supply of skilled workers.

In some occupations an apprenticeship will be the majority entry pathway. However, apprenticeships may also be an important entry pathway in other occupations, such that a shortage of apprenticeship-trained workers would have significant implications for the way the industry operates. For example, in some occupations it may be the case that a proportion of apprenticeship-trained staff is an important component of the structure of an economically efficient workforce. In these circumstances there may be merit in including the occupation on the skills shortage list, subject to evidence there is a shortage in apprenticeship-trained staff.

There may also be a case for listing an occupation that is not expected to be in skills shortage over the projection period, by exception, where there is clear evidence of a critical or impending shortage in apprenticeship-trained workers who are able to train the next generation of apprentices. For example, this might be the case where skilled participants in a niche occupation are predominately in older cohorts.

Some occupations may also be included by exception where it is considered there is a sufficient case to warrant their inclusion, particularly in terms of the perceived or demonstrated economic

and or social benefit. The AAIP Priority Occupations are considered to fall within this category, at least in the short term.

Efficient delivery of incentives

As a general requirement, eligibility for skills shortage incentives will be restricted to qualifications undertaken at the Certificate III/IV level (or a higher level from 1 July 2020 under the Incentives for Australian Apprenticeships program). The apprentice will be required to be both studying an eligible qualification AND working toward a skills shortage listed occupation.

Prioritising occupations

It is proposed that occupations assessed as being potentially eligible for inclusion on the skills shortage list for the purpose of targeting apprenticeship incentives will be ranked according to the intensity of the skills shortage, as well as other factors relevant to the assessment of inclusion.

It is proposed that occupations assessed as having the most acute skill shortages would be eligible for the AISS Payment. This ranking differs from that applied for the 2019-20 apprentice cohort. Employers would only receive assistance under the AISS Payment where their apprentice is assessed as being additional to their usual apprentice intake, as is currently required within the Program Guidelines. This requirement is not proposed to be applied more broadly.

The ANZSCO skill level is not proposed to be used as a primary filter for eligibility for skills shortage incentives, as the significant pathway filter will operate to exclude occupations for which entry is largely met through higher qualifications or less formal entry pathways. However, greater weight will be given to skills shortages in occupations at ANZSCO skill Level 3 over other skill levels.

Occupational analysis

It is proposed that occupations that have been on the NSNL for more than 5 of the last 10 years be progressively reviewed by the National Skills Commission to determine the public benefit of continuing to incentivise these occupations through skills shortage apprenticeship incentives. The objective of the occupational reviews would be to determine whether:

- the cause of the protracted skills shortage, particularly whether there is another policy setting that needs to be addressed before apprenticeship incentives are likely to be effective in addressing the skills shortage;
- there is a better way in which the incentives might be delivered to address the skills shortage – for example to the apprentice rather than the employer; or
- skilled migration might offer a better pathway to addressing the skills shortage than providing targeted apprenticeship incentives.

Occupational analysis might also be applied to any other occupation for which the commencement of new apprentices is found to be unresponsive to eligibility for skills shortage incentives.

4. Alignment of the Proposed Methodology with the Six Design Principles

Table 4 summarises the way in which the six design principles from the Issues Paper are reflected in the proposed replacement methodology.

Table 4: How the design principles are reflected in the high level features of the methodology

Design Principle	Design Response
1. **Single coherent methodology**	One methodology for the NSNL, AISS Payment, Priority Occupations and Trade Support Loans
2. **Forward looking**	A quantitative skills shortage assessment with a five-year horizon
3. **Responsive to skill shortages**	The methodology to be applied and the occupation lists updated annually Consultation to incorporate industry insight
4. **Transparent yet flexible**	Transparency is delivered through: • a quantitative approach to estimating skills shortages • articulation of the filters to be applied in targeting and prioritising apprenticeship incentives • a clearly articulated consultation procedure • clarity about the timeframes for updating lists • clear rules about eligibility for incentives when listed Flexibility is delivered through: • annual updating of the methodology and lists • targeted consultation with industry on draft lists • informed economic and policy judgement applied to the modelling results and consultation outcomes • complementary occupational research and analysis to inform quantitative outcomes
5. **Support informed decision making**	Eligibility for incentives determined by the date of commencement of the apprenticeship Updated lists to be published as part of, or following, the Federal Budget with incentives to apply from 1 July. Eligibility for skills shortage linked incentives to apply for one year after delisting. AISS incentives to apply only for the year an occupation is listed for the AISS Payment.

6.	**Prioritise economic & social benefit**	Eligibility is requisite on an apprenticeship being a significant entry pathway for the occupation
		Occupations where apprenticeship-trained staff have a critical role or that have high social value may be included even where an apprenticeship is not a significant pathway
		Eligibility is conditional on both the qualification and the intended occupational outcome
		Priority to be assigned according to the degree of skill shortage, particularly for the AISS Payment
		Additionality applies to employer eligibility for the AISS Payment (but not more generally)
		The National Skills Commission to undertake occupational research for occupations that experience chronic skill shortages or are unresponsive to incentives

5. Discussion Questions

The proposed methodology outlined in this paper has been developed taking into account the broad support for the six design principles outlined in the Issues Paper and a balanced approach to the competing views about specific aspects of the design. When answering the following questions we ask that you do so from the perspective of needing to develop an approach that can be applied generically across a range of occupations and business circumstances.

Q1. Do you support the proposed methodology for identifying skills shortages for the purpose of allocating apprenticeship incentives?

Q2. Are there specific elements of the methodology that you strongly agree or strongly disagree with? Why?

Q3. If you do not support the proposed methodology or parts thereof, what alternative approach(es) do you propose?

Appendix A – Rationale for the Six Design Principles

Single coherent methodology

The application of a single coherent methodology to identify skills shortages across the apprenticeships space is more likely to deliver greater consistency in outcomes, greater transparency and better quality outcomes than the current disparate approaches underpinning the National Skills Needs List the Additional Identified Skills Shortage Payment and the Australian Apprenticeships Incentives Program Priority Occupations.

Of itself, the skills shortage identification methodology should not preclude occupations on the basis of their size or because they are prospective rather than existing. The targeting of particular outcomes is better achieved through clearly articulated filters or prioritisation principles applied across occupations found to be in skills shortage, than by constraining the occupations to be assessed.

Forward looking approach

Incentives that promote skills development through participation in apprenticeships will necessarily have a considerable lead time before they contribute to the supply of qualified workers who are proficient in their occupation. This lead time could span anywhere from three to six years.

With such lead times it is appropriate to target apprenticeship incentives that are aimed at addressing skills shortages at the shortages that are expected to prevail or arise in a medium term context. While this is not without its challenges, as future outcomes are often different to what they appear years in advance, it has the potential to drive behaviour in ways that better align with future occupational needs.

Aligning incentives to expected future skills shortages provides a signal to individuals seeking to invest in their skills development about occupations that might deliver better prospects for employment stability and income growth.

Responsive to skill shortages

Regular application of any new skills shortage methodology is important for ensuring that apprenticeship incentives intended to address prospective skill shortages are responsive to changes in the projected demand for, and supply of, skilled workers. The absence of a regular review process for the existing National Skills Needs List has led to poor alignment of the list with identified skills shortages.

Incentives that are effective in increasing the supply of skilled workers through the apprenticeship system could be expected to reduce any skills shortage in an eligible occupation over time, other things being equal. Where the demand and supply of skilled workers is in transition toward a more

balanced outcome, a process of regular review will reduce the potential for overinvestment in skilled workers in those occupations.

A regular review process will support the timely inclusion of insights from supplementary occupational research and analysis and improvements in the skills shortage methodology.

Transparent yet flexible

A desirable property of any methodology is sufficient transparency that participants in the system can understand, accept and trust in the process and outcomes. However, in the task of identifying occupational skills shortages there is a need to accommodate judgement within the methodology if quality outcomes are to be achieved. A balance needs to be stuck between transparency and the need for flexibility.

Informed decision making

Maximising the effectiveness of skills shortage incentives requires there to be a clear link between the availability of the incentives and informed decision making by employers and potential apprentices. Employers and apprentices need to be able to easily understand their eligibility for available incentives and have knowledge of changes to their entitlements with sufficient lead time to support informed decision making. However it is also desirable that unintended distortions in employers' or apprentices' employment decisions arising from changes in their entitlements are minimised.

Prioritise greatest benefit

The methodologies outlined under Principle 2 are generic enough to identify a broad range of occupations facing potential occupational skills shortage, regardless of whether the application of apprenticeship incentives would be effective or economically efficient in addressing the identified shortage. Design parameters are required to align the scope of identifiable occupations with the policy objectives of providing apprenticeship incentives and the level of program funding.

In addition to scoping the occupation set under consideration, the design parameters should aim to ensure apprenticeship incentives are delivered efficiently and effectively, and are prioritised towards outcomes that will deliver the greatest economic or social benefit.

Appendix B - Alternative approaches

A single coherent methodology for all skill shortage lists

The focus of this Review is to develop a more robust methodology for identifying skills shortages for the purpose of targeting apprenticeship incentives. A number of submissions called for a single methodology to underpin all skills shortage lists used by the Australian Government, with particular reference to skilled migration.

While there are interdependencies between the provision of incentives to stimulate skills formation through the apprenticeship system (and other education pathways) and determinations regarding temporary skilled migration (and permanent migration), the considerations underpinning each policy focus are different in many respects.

The approaches currently used to provide advice for the purposes of skilled migration have been developed through a rigorous process involving peer and academic review to ensure they are fit for purpose. Nevertheless, there may be scope to achieve greater alignment of approach over time and with the benefit of an assessment of the benefits and shortcomings of the approach proposed in this paper.

A skills-based approach

The foundation of the proposed methodology is based on identifying occupational skills shortages. A number of submissions identified the alternative approach of focussing on shortages of particular skill sets, as opposed to the composite skill sets represented by an apprenticeship.

Moving toward the type of skill set approach implied in these submissions would require a well-founded methodology for linking skill sets to occupational roles and a methodology for forecasting the demand for those skill sets. Changes to the way skill sets are formally recognised by the State and Territory Training Authorities would likely also be a pre-requisite.

One alternative approach that might have the capacity to be made operational in the near term is to apply the qualification to occupation relational analysis developed to support the forecast methodology outlined in this paper to identify the set of apprenticeship qualifications that deliver the greatest outcome in terms of addressing skill shortages across the spectrum of occupations in skills shortage. One implication of this approach might be to shift the focus of skills shortage prioritisation from occupation-specific skills shortages to qualifications that deliver the greatest return in addressing the set of occupational skills shortages.

Biennial review and update process

Several submissions called for the methodology and occupation lists to be updated on a less frequent than annual basis to reduce the effort required through consultation and provide greater stability in listing to support long term workforce planning.

A biennial process may be appropriate should the final methodology design choices lend themselves to less frequent review or, if over time, it is found that there is limited variability in the composition of the occupation list from year to year.

A decision to move to a biennial review process should be based on evidence that doing so would deliver efficiency savings without unduly compromising the responsiveness of the skills shortage list to labour market needs and changing data.

An indicator model approach

A common alternative approach to identifying skills shortages is through the identification of a series of skills shortage indicators that are weighted together to derive a relative assessment of skills shortage. Many of the indicators adopted in these methodologies are contemporary or backward looking indicators and their interpretation in a skills shortage context is not always straight forward.

Relative to an indicator approach, the methodology proposed in this paper has the advantage of being both clearly forward-looking and supportive of quantitative comparisons of the extent of the skills shortages projected to be experienced in each occupation. A strong caveat is that the reliability of such comparisons will only be known after a period of time and with the benefit of a review process. The supplementary analysis contributed through industry consultation and occupational research will further enhance the application of quantitative comparisons.

CGE forecast methodologies

Labour market forecasts prepared within the frame of an economy-wide mathematical model are one means of identifying future occupational needs and areas of potential skills shortage. The main advantage of using such models is that the occupational projections are collectively consistent and accord with economic and demographic relationships, at least as they are defined within the model. However, the results of such models are conditional on the quality of the data upon which they are based and the assumptions underpinning the structure of the model itself and the forecast scenario. As such, the output of such models needs to be used with some caution.

The Department's labour market projections are not bound by the strict mathematical relationships existent in an economy-wide model but are constructed in a broadly similar manner, utilising relationships in historical data, emerging trends and being anchored by an overall employment market outcome.

The advantages of using the Department's projections is that the data is prepared on a regular basis in a manner that is consistent with the Budget projections of the labour market and that a consistent view of the labour market is used across different arms of labour market policy.

Appendix C - Derivation of skills-shortage variables

Future occupational labour demand

The five-year labour demand projections are prepared following the release of the Federal Budget and the Australian Bureau of Statistics (ABS) Detailed Labour Force publication for the month of May and are usually made publicly available around September/October in the same year. The aggregate labour force projection (five years hence) is aligned to the employment projection outlined in the Federal Budget. The occupational disaggregation is derived by extrapolating the labour force composition in the ABS Detailed Labour Force: May publication and trends evident in the published historical data series. This analysis is then refined using other information gleaned from occupational research and industry consultation. The projections and a summary of the methodology is available on the department's Labour Market Information Portal website.

There has not been a formal Departmental assessment of the accuracy of the labour market projections. However, the use of detailed projections that are benchmarked to the Federal Budget projection for employment growth and which draw on the best information available to the Department, is supportive of policy consistency within government. This data set is also used as an input to the lists for temporary skilled migration.

Replacement demand

Replacement demand is the workforce requirement that is expected to emerge over the forecast period as a result of individuals leaving the occupation on a permanent basis.

Replacement demand is calculated by applying a replacement demand parameter to the current employment variable at an occupational level. The occupational replacement demand parameters used in this analysis are drawn from a National Centre for Vocational Education Research (NCVER) research paper released in 2018[2], which was concerned with estimating job openings by occupation over the 2017 to 2024 period. The analysis was conducted at the three-digit ANZSCO level. The three-digit parameters are applied to each occupation at the corresponding four-digit level without variation.

Temporary skilled migration

The Current Employment variable includes the workforce participation of individuals who are employed under temporary skilled migration visas or who have entered the workforce through other migration pathways. The contribution of these workers may also be implicit within the calculation of the entry by a non-apprenticeship pathway variable. In many occupations, some

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[2] Future job openings for new entrants by industry and occupation, NCVER (2018).

proportion of skilled migration may be optimal to encourage transfer of knowledge and skills to the local workforce through overseas workers and professionals. However, beyond this role there is an argument for adjusting the skills shortage data to remove those persons in an occupation on temporary skilled migration visas, to identify the opportunities that could be filled through the resident workforce.

Entry by non-apprenticeship pathway

Determining entry by a non-apprenticeship pathway is the most difficult component of the calculation to derive. An attempt was made to derive a parameter relating non-apprenticeship entry to total entry using 2011 and 2016 Census data and other methods. However, the data derived from this analysis was not suitable for the intended purpose due to confounding of multiple influences in the parameter. As a proxy, two alternative parameters are derived, the values of which reflect the role that apprenticeships, non-apprenticeship VET and non-VET entry pathways are expected to play in delivering workers into the occupation.

The first step is to use the 2016 Census data to derive a parameter for the proportion of workers in an occupation who have as their highest educational attainment a Certificate II/III/IV or Diploma/Advanced Diploma or have a lower qualification level and are in training towards a Certificate II/III/IV or Diploma/Advanced Diploma. This parameter is applied to the gross demand for new workers to remove the proportion assumed to be supplied to the occupation through other pathways.

The proportion of apprenticeships in total VET trained workers is derived for each qualification used by apprentices to enter the occupation, then weighted by the proportion of completions entering the occupation from each qualification to get an overall apprenticeship in VET proportion.

Multiplying the gross demand for workers in an occupation by these two parameters removes the proportion of workers expected to enter the occupation through a non-apprenticeship pathway and yields the gross demand for apprenticeship-trained workers.

Apprenticeship entrance pathway

The apprenticeship entrant data is derived from the Department's Training and Youth Internet Management System (TYIMS). TYIMS data is used in preference to NCVER data as it supports a better mapping of qualifications to occupational outcomes. Completion outcomes over the five year projection period are derived by:

- Mapping qualifications to occupational outcomes;
- Projecting qualification completions over the forecast horizon using current and prior year commencement data to which a completion percentage is applied:
  - Where existing in-training data is insufficient to map the full forecast horizon, future year commencements are assumed to remain at the same level of the latest four quarters for which commencement data are available.

- Applying the qualification to occupation mapping parameters to the projected apprenticeship completions.

Skilled persons not in employment

An assessment of skills shortage should also take into account the potential availability of skilled workers in the economy who are not currently employed in the occupation but have the requisite skills and capability to be so. This pool of workers might include people who have recently transitioned out of the occupation, for example in pursuit of higher income, or who are unemployed or underemployed. Including this pool of skilled workers would draw a distinction between a skill shortage that is absolute and one that might reflect the relative economic returns to participants in different sectors of the economy. The omission of this potential supply of apprenticeship-trained workers creates a bias toward overstating the size of the skills shortage.

Use of TYIMS training data

The projected potential supply of apprentices over the five year projection period is based on a translation from qualification commencements to occupational outcomes. Preliminary analysis indicated that the one-to-one mapping of qualifications to occupations in the NCVER database does not provide a sufficiently nuanced distribution of occupational outcomes to support the projections analysis being conducted at the ANZSCO four-digit occupation level.

This issue has been addressed by utilising the qualification and occupation data in TYIMS. While the occupation data in TYIMS is not subject to any validation process, the potential for errors in the coding of occupations is considered a worthwhile trade-off for the improvement in the mapping of qualifications to occupational outcomes.