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Guidelines for estimating employment supported by the actions, programs and policies of the NSW Government

OFFICE OF FINANCIAL MANAGEMENT

Policy & Guidelines Paper

Preface

Estimates of the number of jobs supported by NSW Government initiatives inform and assist decision making. This Treasury Policy and Guidelines Paper outlines the appropriate methods for estimating the number of jobs that may be supported by the actions, programs and policies of the NSW Government. It also provides guidelines for presenting and describing estimates of jobs supported. These guidelines do not, however, indicate the actions that should be included in jobs supported estimates.

These guidelines aim to assist project decision makers in the public or private sector who require general employment estimation guidelines for Government initiatives. They are also relevant to decision makers who require specific advice for employment estimation associated with infrastructure investment. There is also a dedicated section in the guidelines for nominated agency 'Go-To' people who are assisting the acceleration of suitable projects.

The NSW Treasury Research and Information Paper *Employment Support Estimates–Methodological Framework* (TRP09-3) is a companion paper to these guidelines, and describes in greater technical detail the input-output economic model used.

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Note
General inquiries concerning this document should be initially directed to:
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For printed copies contact the Publications Officer on Tel: 9228 5417.

Contents:

Executive Summary

NSW Treasury provides estimates in the annual NSW Budget of the employment supported by the aggregate NSW Government infrastructure program. Employment support estimates relating to elements of the Government's infrastructure program are also provided from various sources across the Government at the time of significant decisions, such as the issue of a major construction tender. As well as infrastructure projects, other NSW Government policies, programs and actions can have consequences for employment.

While the various estimates are made on a logical and reasonable basis, they may not always be directly comparable when issued from different sources and relating to different types of program and action.

The main purpose of this Policy and Guidelines Paper is to describe methods for deriving estimates for employment supported by NSW Government actions, programs and policies[1], and to clarify the interpretation of such estimates. For the latter the paper provides some reporting protocols.

Different estimation approaches are applicable for different categories of action. Section 1 provides a typology for the different categories of action and identifies the approaches that may be applied for each category.

It is not the purpose of this paper to define actions to be included in estimates of employment supported. It is important, however, to clarify for which Government actions it is appropriate to estimate employment supported and for which it may not be feasible.

Care should be taken in interpreting estimates for job impacts that are based on Input-Output (I-O) models. Such estimates are based on I-O parameters derived from Australia-wide data published by the Australian Bureau of Statistics (as part of the National Accounts), and therefore provide estimates of national impacts. The ABS's I-O estimates are derived from data which the ABS describes as being "of varying quality and frequency" (cat. 5209.0.55.001). The I-O based estimation approach does not provide any information on the timing of impacts.

The employment estimates derived are therefore approximations of ultimate aggregate theoretical impacts. While the estimates are plausible and consistent with the ABS's "fit-for-purpose" concept, they should not be interpreted as though they are literal. Point estimates should be regarded as sitting within a range of possible outcomes.

Estimates for employment supported by a particular action and/or in a particular sector are not in general a measure of net jobs created for the economy as a whole. In particular, demand side measures involve Government spending that ultimately has to be funded, for example via taxation or through the application of user charges. These and other measures provide benefits, but can displace other types of economic activity in some circumstances. While this means that such demand side measures can affect the timing and composition of economic activity, this can help mitigate adjustment costs.

[1] Henceforth in this paper, the term "action" is used as a general term encompassing all policies, programs, commitments and actions undertaken or planned by the NSW Government.

Employment estimates, therefore, should in general be described as “jobs supported by” or “jobs associated with” a particular government action. The protocols set out in section 2 of these guidelines should be followed in any statements made about estimates for the employment supported by NSW Government actions.

Sections 3 and 4 respectively provide guidance for agencies’ Go-To people, and the policy for the derivation of employment support estimates related to the NSW Government infrastructure program. These sections have been drafted so that they may be read on a stand alone basis.

Further guidance on any of the issues covered in this paper may be sought from NSW Treasury.

1. General Guidance on Estimating Jobs Supported

1.1 Typology of NSW Government Actions, Programs and Policies

The scope and methodology for estimating employment supported by a Government action depends on the nature of that action. This section defines a typology covering the types of Government actions that could contribute to supporting jobs - directly or indirectly. The typology is intended to be comprehensive and the categories mutually exclusive so that every type of Government action can be classified under one of the categories.

The typology groups Government actions into three broad types:

- investment in new infrastructure and the procurement of goods and services
- industry assistance and related measures
- actions that affect the supply side of the economy, and so could enhance the productive capacity of the economy.

Spending on new infrastructure and goods and services procurement are both *final demand* components of NSW Gross State Product (GSP). This linkage to GSP ensures consistency with the International Monetary Fund (IMF) national accounting framework used by the Australian Bureau of Statistics (ABS) and their counterpart statistical agencies overseas.

Industry assistance can be provided in many different forms, which may support employment in different ways. While many industry assistance measures aim to influence demand, industry development and business support measures that reduce costs assist the competitiveness of firms, which affects the supply capacity of the economy.

There is a range of other Government actions that also operate on the supply side of the economy. Such actions could assist the productive capacity of the State economy. This includes all regulatory and de-regulatory micro-economic reform policies not included elsewhere.

To avoid double counting employment and other impacts, each action being considered should be uniquely assigned to a single sub-category (or sub-categories) in the typology (noting that some actions could fit under more than one sub-category). For actions that may support jobs through more than one channel, the channels could fall under more than one category. For example, economic infrastructure may have both employment demand side impacts during construction and supply side impacts once commissioned through adding to the productive capacity of the economy.

Table 1.1 Classification for Government Actions, Programs and Policies

Category 1 – Government Final Demand spending

1.1 NSW Government Investment - Infrastructure (or Capital) Program

This sub-category refers to spending by the NSW Government on its own infrastructure. Projects should be classified to this category if they are included (or, in respect of future projects, intended to be included) in NSW Budget Paper No. 4. As such, this sub-category will include capital grants, investment by Government Business Enterprises and privately financed projects (with the exception of toll roads).

1.2 NSW Government Consumption Expenditure

Relates to the procurement of goods and services in support of the operations of an agency, additional to infrastructure investment related purchases. Most of these items will be classified as "Other Operating Expenses" in the agency's financial accounts (further details are provided at the end of this section).

Category 2 – Industry Assistance

2.1 Discretionary Industry Assistance

Covers assistance such as payroll tax rebates determined on a case-by-case basis (e.g. programs such as the Major Investment Attraction Scheme) and the provision of discretionary support for individual businesses.

2.2 Major Events

Major events cover sporting and cultural events of limited duration. Government assistance for major events could be financial or in kind support, or event promotion.

2.3 Major Private Sector Projects

Relates to major private sector development projects that require significant planning and related consents by the NSW Government (e.g. Part 3A approvals). This may include projects being managed by agency Go-To people. Toll roads may be included in this sub-category.

2.4 Generic Investment Attraction

Covers programs such as promotional activities to attract foreign and out-of-State investment to NSW (e.g. International offices).

2.5 Industry Promotion

Covers programs promoting existing businesses in specific NSW industry sectors (e.g. tourism) and programs "selling" NSW business (e.g. support for the Industry Capability Network (ICN)). It could also include some information programs, such as programs providing energy use information.

2.6 Industry Development

Covers strategic industry specific development programs (e.g. policies targeting "green" industries, and creative including film and television). Industry development that is a result of regulatory polices, such as those supporting energy efficiency, could be included in this sub-category. Industry research programs could be included.

2.7 Business Support and Advice

Provision of business advice, information, expert support, and SME programs would be included in this category. Agricultural extension services could be included.

Table 1.1 Classification for Government Actions, Programs and Policies

2.8 Grants, Rebates, and Subsidies

Some one-off or periodic financial assistance grants, rebates, and subsidies provided to individuals or organisations for specific purposes may not have been covered in the other sub-categories. For example, this category could include some educational and environmental grant programs, and welfare related transfers.

Category 3 – Supply Side Measures

3.1 Red Tape Reduction

Covers the removal of unnecessary rules and regulations, duplication, excessive compliance costs, and the shortening of regulatory pathways. The NSW Government's commitment to reduce red tape by $500m will lead to actions classified under this sub-category.

3.2 Training

Training enhances the productive capacity of the workforce, and the employability of individuals. Apprenticeship measures may be included in this sub-category.

3.3 Taxes, Fees and Charges

This sub-category is to cover broad taxation reforms and broad reforms to fees and charges. Discretionary tax exemptions or rebates should be classified under sub-category 2.1.

3.4 Infrastructure

Some infrastructure will add to the productive capacity of the economy. For a given project, the supply side benefits are additional to any identified under sub-categories 1.1, 2.3, or 2.6.

3.5 Goods and Services Procurement

Similar to category 3.4, some goods and service procured could have positive impacts on the economy's productive capacity.

3.6 RD&D Support

This category covers research, development and demonstration programs not elsewhere included.

3.7 Other Micro-economic Policies

This is a residual category to cover any supply side initiatives not included in sub-categories 3.1 to 3.6. For example, it could cover pro-competitive Government measures undertaken as part of the COAG reform agenda. It could also cover regulatory policies designed to address a market failure that have not been included as industry promotion measures under sub-category 2.6.

1.2 Estimation of Jobs Supported

There are two principal approaches for deriving employment support estimates:

- project specific estimates – bottom up
- economic model based estimates – top down[2].

Excluding infrastructure and other procurement the jobs supported by most other Government actions cannot be estimated using a simple model or estimation formula. The impacts of many actions will depend on external factors or be indirect. In particular, the economy can be expected to grow over time and measures assisting labour supply and participation will support job growth. Generally such job growth should not be primarily attributed to such Government measures, as many other factors can be at work.

Project Specific Estimates

Project specific job estimates may be derived as part of a business case analysis or a project planning process. For Infrastructure projects, these job estimates could be based on engineering models and be influenced by demand projections. Such detailed project specific estimates are distinguished from those relying on higher level economic assumptions. As such, estimates are based on the individual characteristics of a project are referred to as "bottom up."

In developing a business case, program specific estimates for direct employment supported may be derived for some types of Government program based on a simple program specific model. For example, the relevant types of labour supply and other inputs could be driven by expected take-up rates. This approach is not designed to capture any flow on interactions with other sectors of the economy.

Program specific estimates for existing programs could also be derived from an assessment methodology that includes surveying stakeholders.

Project specific estimates for direct employment supported are in general preferable to economic model based estimates.

Economic Model Based Estimates

Employment estimates may also be derived from a "standard" top-down economic model that characterises actions in more general terms.

An economic model comprises a theoretical construct that captures the salient economic production mechanisms. We can use mathematical equations that incorporate numerical estimates for the key model parameters and databases. The empirical values in a model may be derived from various sources including published data (e.g. ABS statistics), other published analyses, survey data, econometric analysis, and/or be based on prior reasoning.

[2] Project specific measures could utilise modelling, so the distinction between the two methods is not absolute.

Existing standard economic models may be appropriate for employment estimates for some Government actions, while custom built models may be more appropriate for others. A model could be limited to a particular sector of the economy, or could be an economy wide model. The most commonly used models for assessing economic impacts are input-output (I-O) models and computable general equilibrium (CGE) models.

Input-output models are widely used to assess the economic impact of projects including employment impacts. An I-O model provides industry sector employment multipliers, which are applied directly to spending estimates to formulate employment estimates. This approach makes implicit assumptions about the operation of the economy. It has the benefit of being relatively simple and transparent. Employment multipliers can be used to estimate direct employment, and possible flow on employment supported. Multiplier based estimates for flow on employment could be combined with project specific estimates for direct employment.

The application of I-O multipliers is a “partial analysis” because it does not capture all of the flow on impacts from the project across the economy. Given the simplifying assumptions and data limitations, the resulting employment support estimates must be appropriately presented and interpreted. Guidance is provided in the form of the protocols shown in section 2. The applicability of I-O multipliers is limited to actions having direct demand side impacts from spending that can be quantified.

Detailed guidance on the possible application of I-O multipliers is contained in the sections below for Go-To people (section 3) and relating to Infrastructure Spending (section 4). Appendix 1 outlines the various I-O employment multipliers that can be derived. The companion NSW Treasury Research and Information Paper *Employment Support Estimates – Methodological Framework* (TRP09-3) provides further technical detail on I-O multipliers and modelling.

Care should be taken in estimating and interpreting job impacts that are based on I-O models.

- Such estimates are based on a theoretical relationship, and flow on employment supported cannot be directly observed.
- The I-O parameters are derived from Australia-wide data published by the Australian Bureau of Statistics, and therefore provide estimates of national impacts.
- The ABS's data is subject to sampling errors and other statistical limitations. Therefore any point estimate is an approximation from within a range of possible values. In general estimates should be appropriately rounded..
- The estimation approach does not provide any information on the timing of impacts.

The employment estimates derived are therefore approximations of ultimate aggregate theoretical impacts. While the estimates are plausible and consistent with the ABS's "fit-for-purpose" concept, they should not be interpreted as literal or precise. Point estimates should be regarded as sitting within a range of possible outcomes.

CGE models can be used to assess the impacts of a much broader range of actions than an I-O model. CGE models incorporate a much more detailed representation of the economy, including the multiplicity of flow on interactions between different sectors – hence the descriptive term "general" equilibrium. A CGE model can provide very detailed estimates of the flow on economic impacts from an action originating in a particular industry sector.

CGE models, however, are very complex, requiring a high level of expertise to use. Estimates from a CGE model may be sensitive to assumptions imposed on the model, and are reliant on data that has its own limitations such as sampling errors. CGE modelling cannot avoid subjective judgements. In particular, while a CGE model can provide detailed projections of changes in occupational demand and employment by industry sector, aggregate employment estimates depend on assumptions about wage flexibility.

Therefore, for most actions, CGE modelling would be an excessively costly or time-consuming exercise. CGE models are usually only used to assess the impacts of major economic reforms and large projects and events.

Applicable Methodology

Table 1.2 indicates the possible approaches for deriving estimates of employment supported for each sub-category of Government action. Table 1.2 also identifies the categories for which it may not be feasible or appropriate to derive estimates for employment supported.

Table 1.2 Applicable Methodologies for Estimating Employment Support by Category of Action

Categories	Methodologies that may be applied	Comment	Further Guidance[1]
1.1 and 1.2 Procurement	Project specific estimates for direct employment. I-O Multipliers may be used for direct and flow on employment estimates.	Project specific estimates are preferred, if available. Methods using implied multipliers (i.e. ratios of jobs to spending) should be consistent with the multipliers advised by Treasury to ensure consistency of estimates or otherwise agreed with Treasury. CGE modelling is not recommended.	Refer to section 4 of this paper, and the companion NSW Treasury Research and Information Paper *Employment Support Estimates – Methodological Framework (TRP09-3)*.
2.1 Discretionary Industry Assistance	Project specific methodology	Discretionary assistance is usually based on a detailed business case, which would include consideration of possible employment supported. However, such analysis cannot avoid subjective judgements. Direct employment may be observable for some businesses receiving discretionary support.	Information or guidance on various forms of industry assistance is available on the website of Industry and Investment NSW (see http://www.business.nsw.gov.au/business/)
2.2 Major Events	Events NSW methodology.	Any employment supported is likely to be very short-term for most events.	Events NSW Initial Event Assessment Guide (http://www.eventsnsw.com.au/events_strategy/)
2.3 Facilitation of Major Private Sector Projects	Project specific estimates for direct employment. I-O Multipliers may be used for direct and flow on employment estimates.	Proponent's estimates should be used if available, and clearly attributed to the proponent. If not available, estimates may be made based on I-O multipliers.	Refer to section 2
2.4 Generic Investment Attraction	Economic modelling is not recommended. It may be possible to derive estimates from survey data of investors and other stakeholders.	Given the difficult of isolating the contribution of investment attraction programs, it is not possible to derive robust estimates for employment supported from an economic model.	Given possible costs of survey based estimates, agencies may wish to consult NSW Treasury before commencing.

Table 1.2 Applicable Methodologies for Estimating Employment Support by Category of Action

Categories	Methodologies that may be applied	Comment	Further Guidance[1]
2.5 Industry Promotion	Economic modelling is not recommended. It may be possible to derive estimates from survey data of beneficiaries and other stakeholders.	Similar difficulties to 2.4. Some programs will generate data such as volume of advice provided by the Industry Capability Network (ICN), which could provide a basis for estimates.	If a case can be made for modelling a particular program, consult NSW Treasury.
2.6 Industry Development	Case by case estimates for individual programs such as a feed in tariff, or an energy efficiency program, may be based on a program specific model. Methodology for calculating low carbon ("green") jobs supported by a program will depend on the initiative. Initiatives under this sub-category that are project based (such as film and television) could have project based estimates of jobs supported.	Promoting green jobs involves a number of supply and demand side initiatives, as such, it is important not to double count. Attribution of jobs to policy may be unclear. Credible third party analysis may be available for some programs, and should always be attributed to its source. Film and television projects will provide short-term jobs only.	Consult NSW Treasury on proposed assessment approach. NSW Treasury may be consulted re the use of any third party analyses.
2.7 Business Support and Advice	Economic modelling is not recommended. There may be cases for which individual project based estimates can be made.	Attribution of jobs to policy may be unclear.	Consult NSW Treasury on proposed assessment approach.
2.8 Grants rebates and subsidies	Project specific estimates for direct employment.	Direct employment may be ascertained for some grant, subsidy, and rebate programs.	Consult NSW Treasury on proposed assessment approach, and/or re quality of any external modelling.
3.1 Red Tape Reduction	CGE Model based estimates for aggregated programs. If relevant credible external modelling is available, it may be used.	CGE modelling would have to be commissioned, and the consultancy cost is a relevant consideration. External modelling should be attributed to its source.	Consult NSW Treasury on proposed assessment approach, and/or re quality of any external modelling.

Table 1.2 Applicable Methodologies for Estimating Employment Support by Category of Action

Categories	Methodologies that may be applied	Comment	Further Guidance[1]
3.2 Training – includes apprenticeships	Case by case estimates for some programs may be possible, such as re-employment. If relevant credible external modelling is available, it may be used.	Depends on assumptions about demand and state of economy. Addressing skill shortages can support employment directly. Will support job growth in up turn.	Consult NSW Treasury on proposed assessment approach before commencing assessment, and/or re quality of any external modelling.
3.3 Taxes, Fees and Charges	Economic modelling of employment impacts is not appropriate.	Revenue has to be raised to cover the costs of Government policies. Should not in general attribute job creation to tax reforms. Such reforms are usually undertaken to produce other benefits.	
3.4 Infrastructure and 3.5 Goods and Service Procurement	Economic modelling is not recommended. However, if relevant credible external modelling is available, it may be used.	There may be cases for which individual project based estimates can be made. Depends on assumptions about demand and state of economy. Will support job growth in up turn.	Consult NSW Treasury on any proposed assessment approach, and/or re quality of any external modelling.
3.6 RD&D Support	Case by case estimates for some programs may be possible. Economic modelling is not recommended. However, if relevant credible external modelling is available, it may be used.	Depends on assumptions about demand. Will support job growth in up turn.	Consult NSW Treasury before commencing assessment, and/or re quality of any external modelling.

Table 1.2 Applicable Methodologies for Estimating Employment Support by Category of Action

Categories	Methodologies that may be applied	Comment	Further Guidance[1]
3.7 Other Micro-economic Policies	CGE Model based estimates for major reforms only. If relevant credible external modelling is available, it may be used.	Use external estimates if available, e.g. from COAG process. Should be attributed to source. Depends on assumptions about demand. Some reforms will support job growth in up turn.	Consult NSW Treasury on any proposed assessment, and/or re quality of any external modelling.

1. While NSW Treasury will provide guidance on a proposed approach, or otherwise attempt to assist agencies, Treasury cannot undertake modelling on behalf of agencies and does not have direct access to any action specific economic models.

1A. NSW Government Consumption Expenditure – Table 1.1 category 1.2

As shown previously, Category 1.2 in Table 1.1 includes most goods and services procured under contracts administered by the Department of Services, Technology and Administration. For example, major categories include:

- Travel management and related services (e.g. international and domestic travel, car hire, accommodation)
- Food (e.g. grocery items such as fresh and processed food items, water and dispensing equipment, bread and bakery products, catered meals)
- Office and workplace supplies (e.g. stationery, documents and printing, furnishings, workplace clothing and accessories)
- Property management and maintenance (e.g. security services, cleaning and waste removal)
- Educational supplies (e.g. whiteboards, chairs/stools/desks, sporting equipment)
- Transport (e.g. fuel, motor vehicle oils, acquisition of motor vehicles – but only where these are not included in the agency's capital investment program, courier and delivery systems, transport-related insurance)
- Telecommunications (e.g. phones, telecommunications cabling)
- Health and Hygiene goods and services (e.g. pharmaceuticals, medical and laboratory products, dental consumables, syringes, sterilisation equipment, staffing supplies such as protective medical clothing, burial services)
- Information technology (e.g. desktop and portable computers, system platforms, application systems, other IT-related services – but only where these are not already included in the agency's capital program in Budget Paper No.4)
- Utilities (e.g. electricity supply, gas)
- Hardware and construction (e.g. hardware equipment, electrical and other appliances, equipment for building interiors – but only where these are not already included in the agency's capital program in Budget Paper No.4).

2. Protocols for the Presentation of Estimates for Jobs Supported

2.1 Presentation Protocols

Input-output based estimates of jobs supported by Government actions, in general, cannot be interpreted or represented as additional jobs created. This is because in most cases the approach taken to derive estimates will not have taken into consideration resource constraints or made allowance for the funding of expenditure. Most estimates are contingent on a range of assumptions and subject to data limitations.

Guidance is provided in the form of the following presentation protocols.

1 Employment estimates should be described as "jobs supported by" or "jobs associated with" government spending. Terms such as "created by", "caused by", or "induced by" should be avoided.

2 Estimates provided by a third party should always be attributed to that party, and described in the same terms as those used by the party.

3 Direct or flow on jobs will not necessarily occur in the immediate vicinity of the project – they may be located in head office of the supplier or in a factory in another region or State that supplies the project.

4 In general, direct employment by the NSW Government, including in the administration of programs, should not be included in estimates for employment supported.

For I-O Multiplier based estimates:

1 I-O multiplier based estimates relate to annual full-time equivalent (FTE) jobs. They should not be presented as permanent jobs.

2 Some industries have significant part-time employment. I-O multiplier based estimates of direct employment (i.e. that from the *initial effect* multiplier) are for full time equivalents. This estimate could be converted into a total employment estimate if there is relevant data available.

3 Part time and temporary employment estimates may be converted into full time annual equivalents using the method outlined in section 2.2 below.

4 I-O multiplier based employment estimates derived from turnover relate to full time equivalent jobs that will continue as long as the project continues to operate at the scale proposed.

5 As the available multipliers are derived from a national I-O table published by the ABS, in such a way as to exclude imports, the economy wide production induced employment effects can happen anywhere in Australia. Therefore multiplier based estimates for employment supported should not be reported as being for NSW, or as occurring in a project's region.

6 I-O employment estimates relate to average industry impacts rather than marginal impacts. I-O modelling provides no information on the possible timing of impacts.

7 I-O employment estimates are not precise and should therefore be appropriately rounded.

8 Wherever practical, estimates derived from I-O employment multipliers should be presented as such, including clarifying whether flow on impacts have been included.

9 Estimates for employment supported should not be presented as if it is an additional benefit to the project's gross output or impact on NSW net output (Gross State Product) as this would amount to double counting.

10 The Government publishes statements about the employment supported by the total infrastructure program in the annual Budget. Estimates for jobs supported made at the time tenders commence or are awarded are not additional to the total estimated jobs supported for the NSW Government's infrastructure program.

11 Care should be taken to avoid the double counting of employment supported by Government actions. This requires active co-ordination with other relevant agencies.

12 References to individual employment multipliers should utilise the standard terminology (see Appendix 1).

13 For infrastructure related projects, the protocols in section 4.2 apply.

2.2 Converting to Annual Full-Time Equivalent Jobs

Project based employment support estimates could include both part-time and full-time positions. In general employment will be supported for the life of a project and employment support estimates therefore do not typically relate to permanent positions. With this in mind converting employment supported estimates to annual full time equivalence can assist comparability and aggregation.

In the absence of specific information for a given industry sector, part-time employees for one year should be assumed to be 0.5 of an annual FTE job and casual employees assumed to be 0.33 jobs.

A project that employs 10 people for two years in full time positions, and 10 people for two years in part time positions and three casual employees for one year, could be converted to annual full time equivalent jobs as follows:

Full-time employees	10 x 2 = 20
Part-time employees	10 x 2x 0.5 =10
Casual employees	3 x 0.33 = 1
Total annual FTE	31

Accordingly, when an assessment of jobs numbers from a particular project is received from a contractor or proponent, conversion to full-time equivalent positions maintains clarity of communication.

3. Specific Guidance for Agency Go-To People

3.1 Introduction

Following the NSW Jobs Summit in February 2009 the Government nominated a number of "Go To" people in selected agencies to assist in facilitating suitable projects. This section provides guidance on estimating and reporting on jobs supported by projects being managed by a "Go-To" person. The section has been drafted so that it can be read on a stand-alone basis.

Specific guidance is provided on the use of an I-O multiplier based method to estimate the employment support impact of such projects. It is expected that these will mainly be private sector funded projects under sub-category 2.3 in Table 1.1 above.

3.2 Presentation of Estimates for Jobs Supported

Estimates of jobs supported by projects brought to agencies' Go To people should not be interpreted or represented as additional jobs created. The I-O Multiplier estimation methodology for employment supported detailed in this section does not take into consideration resource constraints. It also makes no allowance for the funding of expenditure, is contingent on a range of simplifying assumptions and is subject to data limitations.

The protocols in section 2 should be observed when making statements about employment associated with Go-To projects.

3.3 Estimation of Jobs Supported

There are two principal methods recognised in this paper for deriving estimates of employment impacts - project specific direct estimates and estimates based on an input-output (I-O) economic model. Section 1.2 above and Appendix 1 below provide further details on I-O modelling.

The scope for estimating employment support will depend on the nature of the project. The types of project that could be taken to a Go-To person cannot all be known in advance. They are expected, however, to include significant private sector development projects. They could also include small projects that may be of some strategic interest to the NSW Government.

Some of these projects may involve direct employment. In addition, there may be employment associated with the construction of a project and other establishment activities and purchases, as opposed to its operation.

The provision of accommodation (offices and factory units) does not support employment in the absence of unmet demand for such accommodation. Therefore employee capacity should not in general be represented as employment supported.

Project Specific Direct Jobs Estimates

Proponents for projects involving direct employment may provide their own estimates of the project's associated employment. As well as direct employment, an estimate of flow on employment may have been made by the proponent. A proponent's employment estimates may be used by the Go-To person providing that they pass the *reasonable multiplier test* described in the following section.

The Go-To person may invite a proponent to provide an estimate of direct employment supported. The Go-To person should always clearly attribute a proponent's estimates to that proponent in the precise terms used by the proponent, provided that they are reasonable. In particular, it should be made clear whether the estimates are on a *full-time equivalent* (FTE) basis or whether they include part-time employment.

Reasonable Multiplier Test

The *reasonable multiplier test* requires comparing the FTE employment multiplier/s implied by the proponent's estimates for employment supported with the relevant sectoral I-O employment multipliers in Table 3.1 below. If the proponent's estimates include both direct and flow on employment, comparisons will be required with both the *initial effects multiplier* and *first round multiplier*.

To identify the relevant multipliers the project must be assigned to the appropriate industry sector or sectors per the approach below. For comparisons, the proponent's estimates must be converted to a FTE basis. If the implied multipliers are more than 20 per cent higher than the prescribed I-O multipliers, the employment supported estimates should be based on the prescribed multipliers. An exception, however, may be made if the proponent can provide a rigorous justification for its higher estimate.

Further guidance on the *reasonable multiplier test* may be sought from NSW Treasury.

Input-Output Employment Multiplier Based Estimates

If the proponent has not provided estimates of employment supported by a Go-To project, such estimates can be derived from an input-output (I-O) economic model.

The Australian Bureau of Statistics (ABS) publishes I-O tables for Australia that provide for the derivation of employment multipliers for the industry sectors per the sectoral classification utilised by the ABS. In the past, new I-O tables have been released every two or three by the ABS usually with a delay of at least 3 years from the year to which the data pertains. The most recent I-O table available when the estimates in this paper were made was released by the ABS in November 2008 containing information for 2004-05.

Guidance will be updated from time to time in Treasury Circulars.

Users must take care to check that they are using the most recent information advised by NSW Treasury, by ensuring reference to the latest available Treasury Circular published on the NSW Treasury website http://www.treasury.nsw.gov.au/nswtcir.

Table 3.1 provides the multipliers derived from the 2004-05 I-O table for the ABS industry sectors that best align with those associated with the Premier's nominated Go-To people. Section 3A provides further detail on the components of each industry sector.

A proposed Go-To project may not align precisely with the industry sectors in Table 3.1. It may then be appropriate to use a weighted average of the multipliers based on an estimated split of turnover, if possible. Where the relevant industry sector or sector shares cannot be readily estimated, NSW Treasury may be contacted for further guidance.

The employment multipliers provide for an estimate of employment supported nationally, for an average business in the given industry sector for each $m of turnover. The estimates are national estimates because they are derived from a national I-O table. The ABS does not publish state level I-O tables.

Table 3.1: Industry Sector Employment Multipliers - Employment supported per $m (FTE no.)

Composite Industry Sector	Initial effect	First round effect
Infrastructure and Construction	6	4
Creative Industries	6	2
Education and Training	11	1
Finance and Insurance	3	3
Information, Communications & Technology	Depends on the industry sector where the ICT will be acquired. If sector not listed in this table, consult NSW Treasury.	
Food, Beverage and Tobacco Manufacturing	4	1
Textile, Clothing, Footwear and Leather Manufacturing	9	0
Petroleum, Coal, Chemical and Associated Product Manufacturing	3	2
Metal Product Manufacturing	3	3
Machinery and Equipment Manufacturing	4	2
Other Manufacturing	5	1
Agriculture, Forestry and Fishing	7	2
Mining	2	1
Property and Business Services	5	11
Retail	11	3
Tourism and Hospitality	7	3
Transport, Logistics and Storage	5	5
Green Skills (Environmental Technologies)	Depends on industry sector where green skills will be acquired. If sector not listed in this table, consult NSW Treasury.	

Source: ABS Catalog. 5209.0.55.001 - Australian National Accounts: Input-Output Tables - Electronic Publication, 2004-05 Final

The multipliers in Table 3.1 provide for employment multiplier based estimates associated with two potential effects (Appendix 1 contains further details):

- *Initial effect* – direct employment in an industry per $m per year (on a full-time equivalent basis); and the
- *First round effect* – employment associated with the inputs purchased by the industry of the direct spending, per $m per year (on a full-time equivalent basis).

These two effects are additive.

The employment supported estimates relate to gross employment as they do not account for any displacement effects in other sectors.

For industries that have significant part-time employment the full time equivalent estimate of direct employment (i.e. that from the *initial effect* multiplier) could be converted into a total employment estimate. This would require data on the composition of the workforce in the industry.

In addition to the employment supported by the operating inputs associated with a proposed project, there may be additional employment supported by an initial investment element. This investment could include a construction component and/or the acquisition of equipment or other assets. If the composition of investment can be approximated, this additional employment supported can be estimated using the multipliers in Table 3.1. This employment would only be short term, such as for the period of construction, and estimates would have to be adjusted to FTE annual employment for comparison purposes.

3.4 Example of Application of Multipliers to Go-to Projects

The multipliers in Table 3.1 can be applied to the estimated annual gross output (i.e. turnover) associated with the project.

A proposed tourism development is projected to have an annual turnover of $10 million in year two, growing to $20m from year four onwards. The project would involve initial construction costs of $50m and a two-year construction period.

From Table 3.1 the *initial effect multiplier* for the *Tourism and Hospitality* sector is seven and the *first round effect* multiplier is three.

The initial effect multiplier implies that in year two around 70 FTE direct jobs would be supported (i.e. $10m x 7 FTE jobs/$m), growing to around 140 FTE direct jobs from year four onwards.

The Tourism and Hospitality sector has a high proportion of part time labour. If the average employee in the industry worked for 2/3 of a full-time equivalent then each FTE position is equivalent to 1.5 staff on a head count basis on average. Therefore the estimated direct employment amounts to around 105 persons in year two (i.e. 70 divided by 2/3) growing to 210 persons by year four. The head count estimate includes both full-time and part-time employees.

The first round flow on would be support for around 30 FTE jobs for suppliers to the project in year two (i.e. $10m x 3 FTE jobs/$m), growing to around 60 FTE jobs from year four onwards.

From table 3.1 the *initial effect multiplier* for the *Infrastructure and Construction* sector is six and the *first round effect* is four. As construction of the project is projected to take two years we will assume that half of the $50m construction cost is expended each year. The initial effect multiplier implies this construction work will support around 150 jobs directly for years 1 and 2, and the first round multiplier indicates around a further 100 supplier jobs will be supported for these years.

Table 3.2 summarises the estimated employment supported, including that related to the construction phase.

Table 3.2: Tourism Example – Multiplier Based Estimates for Employment Supported

year	Initial, FTE	Initial, head count	First round, FTE	Total, FTE	Total, head count
1	150	150	100	250	250
2	220	290	130	350	420
3	105	157	45	150	202
4 onwards	140	210	60	200	270

The sum of values in each of the columns in table 3.2 can be interpreted as the number of annual jobs supported over the first four years of the project. For example, the second last column shows that the project is estimated to support around 950 FTE annual jobs over four years. Some rounding may be appropriate in the presentation of such estimates.

3A. Concordance - Industry sector by ABS I-O industries

Table 3.3: ABS I-O industry sectors included in each of the composite industry sectors in Table 3.1 above.

Industry sector	ABS I-O Table Industry Sectors, 2004-05
Infrastructure and Construction	- Residential building - Other construction - Construction trade services
Creative Industries	- Motion picture, radio and television services - Libraries, museums and the arts
Education and Training	- Education
Finance and Insurance	- Banking - Non-bank finance - Insurance - Services to finance, investment and insurance
Information, Communications & Technology	- Scientific research, technical and computer services
Food, Beverage and Tobacco Manufacturing	- Meat and meat products - Dairy products - Fruit and vegetable products - Oils and fats - Flour mill products and cereal foods - Bakery products - Confectionery - Other food products - Soft drinks, cordials and syrups - Beer and malt - Wine, spirits and tobacco products
Textile, Clothing, Footwear and Leather Manufacturing	- Textile fibres, yarns and woven fabrics - Textile products - Knitting mill products - Clothing - Footwear - Leather and leather products
Petroleum, Coal, Chemical and Associated Product Manufacturing	- Petroleum and coal products - Basic chemicals - Paints - Medicinal and pharmaceutical products, pesticides - Soap and detergents - Cosmetics and toiletry preparations - Other chemical products - Rubber products - Plastic products
Metal Product Manufacturing	- Iron and steel - Basic non-ferrous metal and products - Structural metal products - Sheet metal products - Fabricated metal products
Machinery and Equipment Manufacturing	- Motor vehicles and parts, other transport equipment - Ships and boats - Railway equipment - Aircraft - Photographic and scientific equipment - Electronic equipment - Household appliances - Other electrical equipment - Agricultural, mining, etc. machinery - Other machinery and equipment

Industry sector	ABS I-O Table Industry Sectors, 2004-05
Other Manufacturing	- Sawmill products - Other wood products - Pulp, paper and paperboard - Paper containers and products - Printing and services to printing - Publishing, recorded media, etc. - Glass and glass products - Ceramic products - Cement, lime and concrete slurry - Plaster and other concrete products - Other non-metallic mineral products - Prefabricated buildings - Furniture - Other manufacturing
Agriculture, Forestry and Fishing	- Sheep - Grains - Beef cattle - Dairy cattle - Pigs - Poultry - Other agriculture - Services to agriculture, hunting and trapping - Forestry and logging - Commercial fishing
Mining	- Coal - Oil and gas - Iron ores - Non-ferrous metal ores - Other mining - Services to mining
Property and Business Services	- Other property services - Legal, accounting, marketing and business management services - Other business services
Retail	- Retail trade - Retail mechanical repairs - Other retail repairs
Tourism and Hospitality	- Accommodation, cafes and restaurants - Sport, gambling and recreational services
Transport, Logistics and Storage	- Road transport - Rail, pipeline and other transport - Rail, pipeline and other transport - Air and space transport - Services to transport, storage
Not included	- Electricity supply - Gas supply - Water supply, sewerage and drainage services - Wholesale trade - Wholesale mechanical repairs - Other wholesale repairs - Communication services - Ownership of dwellings - Government administration - Defence - Health services - Community services - Personal services - Other services

Source: ABS Catalogue 5209.0.55.001 - Australian National Accounts: Input-Output Tables - Electronic Publication, 2004-05 Final

4. Specific Guidance for Infrastructure Spending

4.1 Introduction

This section briefly describes the input-output (I-O) multiplier methodology and its application to infrastructure investment. It provides the values for employment multipliers that may be applied based on ABS Input-Output data for 2004-05. The section has been drafted so that it can be read on a stand-alone basis.

4.2 Presenting Estimates for Jobs Supported

The I-O model provides a method for approximating the direct and flow on employment impacts of changes in sectoral demand, such as those associated with government infrastructure spending. The approach does not take into consideration resource constraints and makes no allowance for the funding of expenditure. It is also contingent on a range of assumptions and is subject to data limitations.

Infrastructure projects must be subject to a cost benefit analysis to ensure that the associated economic benefits exceed the costs. As such, they add to the supply side of the economy, enhancing productive capacity providing for employment growth and other ongoing economic benefits. Spending on infrastructure is also a form of demand (i.e. investment demand), with the direct employment impacts that persist for the duration of construction providing another incidental benefit.

Any assessment of the employment associated with the NSW Government Infrastructure Program (as covered by Budget Paper no. 4) is by its nature an exercise in approximation. There is no exact deterministic link from infrastructure program implementation to job creation or support and no irrefutable way of establishing the number of jobs a particular project will support. The most rigorous methodologies that are available to estimate employment impacts have to rely on simplifying assumptions about the operation of the economy, and must utilise ABS industry sector data that is subject to sampling errors and includes synthetic estimates.

Nevertheless the I-O employment multiplier approach described in this section is a well established and widely used approach with a sound theoretical basis that provides for reasonable estimates. It has the benefits of being based on independently derived published data, transparently applied, and the derivation of estimates will be replicable. This Policy and Guidelines Paper and the associated research paper further detailing the methodological framework[3] are intended to provide transparency on the approach.

[3] NSW Treasury, *Employment Support Estimates – Methodological Framework (TRP09-3)*.

Guidance for presenting employment support estimates associated with the infrastructure program is provided in the following protocols which should be used along with those set out in section 2.

1 For the aggregated infrastructure program (detailed in Budget Paper No.4), multiplier based employment estimates that may be published in the Budget Papers include the *initial effects* and the *production induced effects*, i.e. the *simple multiplier*. The *consumption induced effect* is very indirect, and therefore will not be included in published estimates.

2 The estimates for employment supported by the NSW Government's infrastructure program published in the state Budget cover all projects identified in Budget Paper no. 4 (the *Infrastructure Statement*). Estimates for employment supported by individual infrastructure projects or groups of projects should not be presented as additional to those estimated for the aggregate program.

3 Where relevant information on employment supported is available from an economic appraisal[4], individual project estimates for employment supported should be restricted to the direct "*initial effect*".

4 The flow on *first round* and *industrial support* effects can be acknowledged as a further benefit. If there is project specific information available on direct employment and/or *first round* employment associated with the purchase of supplies, this can be utilised. However, *first round* multipliers should not generally be applied for individual projects because this may give a false impression as the estimates are based on industry sector averages.

5 The supply side benefits of infrastructure investments that enhance the productive capacity of the economy may be acknowledged. While this may support employment growth and provide ongoing benefits, these benefits cannot be readily approximated and are not included in multiplier based estimates.

Updated guidance on multipliers will be provided from time to time in Treasury Circulars.

Users must always take care to check that they are using the most recent information advised by NSW Treasury, by ensuring reference to the latest available Treasury Circular published on the NSW Treasury website http://www.treasury.nsw.gov.au/nswtcir.

[4] See *NSW Government Guidelines for Economic Appraisal* (TPP07-5).

Sectoral Employment Multipliers

The following multipliers were derived from I-O Tables published by the ABS for 2004-05 (released in November 2008), which were the latest available at the time this paper was prepared. The 2004-05 table has 109 Industry Sectors based on the contemporary *Australian and New Zealand Standard Industrial Classification (ANZSIC)*. Changes in industry sector classifications that are necessary from time to time to reflect the changing composition of the economy do limit the comparability with multipliers derived from earlier I-O tables. In addition, the ABS advises that because of other technical changes in the formulation of the I-O data, these multipliers are not strictly comparable with the multipliers from earlier I O tables.

The employment multipliers in Table 4.1 are a single weighted average for the total infrastructure program. Based on analysis of projects included in the planned infrastructure program for the period 2009-10 to 2012-13, capital expenditure is classified to two broad categories:

1. Equipment
2. Construction and construction-related services

These two broad categories do not correspond directly to single industry sectors in the 2004-05 I-O table. They are composite sectors – in effect being weighted averages of several of the ABS industry sectors. The weights reflect the composition of NSW Government's aggregate planned infrastructure spending.

The multipliers relate only to domestic employment within Australia, and do not include overseas employment associated with imports.

Table 4.1: Employment multipliers for aggregate infrastructure program, per $m per annum

Initial Effect	*Production Induced Effects*	*Simple Multiplier*
4	6	10

Table 4.2: Employment multipliers for infrastructure projects – industry sectors where initial spending is made, per $m per annum

Industry Sector	*Initial Effect*
Equipment	5
Construction	3

Section 4.3 provides an illustrative example of the application of these multipliers. The production induced effects multipliers are not provided, which is consistent with the above protocols.

Industry sector classifications:

The two broad equipment and construction industry categories comprise weighted averages of the various industry sectors in the ABS 2004-05 Input-Output tables, as shown in Table 4.3 below. The employment support estimates that have been published have allocated total infrastructure spending to one or other of the sectors shown in Table 4.3.

Table 4.3. 2004-05 Industry Sector Classifications – Major Expenditure Sectors for NSW Government Infrastructure Program

Input/Output industry sector	Input/Output industry code	Examples of types of public capital expenditure that may be included in this category
Equipment		
Scientific research, technical and computer services	7801	Information and communications technology (ICT) systems and services – e.g., this may include the cost of acquisition of hardware and software as well as implementation and related services.
Motor vehicles and parts, other transport equipment	2801	Transport equipment – e.g., this may include buses and motor vehicles, including fleet replacement and navigational aids.
Other electrical equipment	2808	Electrical/electronic equipment – e.g., this may include photocopiers, cash registers, electronic communications devices, transformers.
Photographic and scientific equipment	2805	Photographic and scientific equipment – e.g., this may include aerial or digital photographic equipment, highly specialised medical or diagnostic equipment.
Other machinery and equipment	2810	This is a residual category to allow the classification of those projects which do not clearly belong in the other equipment categories.
Construction and related services		
Construction trade services	4201	This may include planning, studies, pre-feasibility activities, obtaining development approvals, or the cost of consultancies to undertake such activities.
Other property services	7702	This may include costs incurred on land and buildings – e.g., the cost of improvements to building or grounds, site acquisition, capital costs of office accommodation such as office refurbishment.
Residential Building	4101	This may include expenditure on public housing, capital costs of dwelling units for social welfare purposes (e.g., dwellings administered or acquired by DADHC), and housing for teachers.
Other construction	4102	This is a residual category, to which are classified those projects which do not clearly belong in the other construction categories.

Source: ABS Catalogue 5209.0.55.001 - Australian National Accounts: Input-Output Tables - Electronic Publication, 2004-05 Final.

4.3 Example of a Project Assessment and a Program Assessment

Appendix 1 outlines the various employment multipliers that can be derived from the ABS Input-Output tables.

Consider a one year infrastructure project with a budgeted cost of $110m to be commenced and completed over a period of two financial years.

An assessment of the project concludes that of the $110m budgeted, around $74m relates to construction works with the remaining $36m being equipment purchases.

The estimate for employment supported by the project should be presented as set out in this section.

The relevant employment multipliers for the two industry sectors are as follows:-

	Initial effect	*Production induced effect*	*Simple multiplier*
Equipment	5	-	-
Construction	3	-	-
Aggregate	4	6	10

Using the *initial effect* multipliers this project will on average support up to 402 full time equivalent annual jobs through direct employment on the construction site and direct employment by the equipment suppliers to the project across the country (74m x 3 + 36m x 5). The average number of jobs associated with the project each year will be around 200.

As this spending relates to a single project the production induced effects are not quantified.

This estimate should be rounded, and could be presented in the following terms:
Infrastructure project X will support around 400 full time direct annual jobs. This estimate does not include additional flow on employment the project may support.

Consider a one year infrastructure program comprising many projects that is budgeted to have a total cost of $11.55 billion. An assessment of the program concludes around $7.37 billion will be spent on construction works and around $4.18 billion on equipment purchases. Based on the above *initial effect* multipliers the program collectively will support 43,010 direct full time equivalent annual jobs. The *production induced effect* may also be included under the protocol. The program will support up to a further 63,300 full time equivalent annual jobs throughout the Australian economy through companies directly and indirectly providing supplies in the delivery of this program.

This could be presented as:
The Government's $11.55 billion infrastructure program will support an estimated 110,000 full time equivalent direct and indirect annual jobs nationally.

Appendices

Appendix 1: Deriving Estimates of Employment Supported Using Input-Output Multipliers

Estimates of the aggregate employment supported by spending programs including the NSW Government's infrastructure spending can be made using input-output (I-O) employment multipliers derived from an I-O table. The widely used multiplier methodology has the benefit of being straightforward and transparent. An I-O table gives a simplified representation of industry linkages for a given financial year.

The industry sector estimates are derived within the "national accounts" framework, which means they reconcile to national account aggregate measures such as Gross Domestic Product. The ABS' input-output tables for the Australian economy are the best data available for purposes of multiplier analysis[5]. As the construction of input-output tables is a complex task the ABS past practice has been to publish input-output tables for select years only, usually with a three or four-year delay.

An I-O table represents the economy as a relatively small number of discrete industry sectors[6]. The input-output employment multipliers that can be derived from an I-O table for each industry sector are an annual average. Accordingly, estimates of jobs supported by infrastructure spending based on 2004-05 I-O employment multipliers are based on the assumption that the composition of the infrastructure spending program matches the average the relevant industry spent in 2004-05 over the period of investment activity.

In practice, some infrastructure projects will be very different to the average. For example, while most of the spending associated with the construction of a road and a gas pipeline may fall within the same "construction industry" sectors identified in the 2004-05 I-O table, the pipeline would have a much higher proportion of imported materials than the road project.

There is inevitably some judgment required to group activities into a homogeneous "industry sector", and the ABS's standard industry sector classification is modified from time to time to accommodate new and changing industries. Of particular note for government investment spending, the ABS' standard industry classifications have not contained a separate "Information Technology (IT)" industry until the most recent revision (ANZSIC 2006), which post dates the 1993 ANZSIC classification used for the 2004-05 I-O Table. In the 2004-05 table, IT was included as a cost component of the various industry sectors classified.

Various employment multipliers can be derived from an I-O table and the terms used below are consistent with the standard terminology adopted by the ABS. I-O transactions tables can be used to estimate four separate components of employment supported by the State's infrastructure spending:

- direct employment
- first round backward linkage employment
- flow on backward linkage employment
- forward linkage consumption spending related employment

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5 The ABS does not derive input-output tables for individual States and Territories.

6 The 2004-05 Input-Output Table has 109 industry sectors. The current ANZSIC identifies almost 160 industry sectors.

The first step in formulating an employment estimate requires allocating the direct spending expected to be undertaken to one or more of the industry sectors per the ABS classification. For most infrastructure projects a large proportion of the direct spending will be in the construction related sectors. There may also be direct spending on various types of equipment and other business services.

The annual spending for each sector multiplied by the so called "*initial effect*" employment multiplier provides an estimate for the direct employment supported within each industry sector subject to direct spending. For the direct spending in the construction sectors the direct employment includes that on the construction site or associated with the other activities that are classified within the construction sectors. The initial effect employment multiplier is based on the number of people employed in an industry relative to the output of the industry. The direct employment estimates are for the number of jobs directly supported per million dollars of expenditure for each 12 month period.

Secondly, the "*first round"* I-O employment multiplier can be used to estimate the jobs associated with the first round expenditure effect, i.e. the inputs purchased by the industries subject to the direct spending. This would include material purchases for a construction project from a supplier industry (say the steel or cement industry). The first round multiplier is again applied to the annual spending for each sector.

As these two effects are fairly direct these impacts could also be directly estimated using detailed analysis of the actual or planned expenditure for specific projects.

The third type of I-O employment multiplier relates to the flow on of these purchases throughout the economy and is referred to as the "*industrial support effect*". Material purchases in the first round effect will themselves generate a demand in, say, the mining or quarry sector and other effects in some of the service sector and the transport sector. These in turn will generate further backward linkage effects. The industry support employment multiplier is again applied to the annual spending for each sector. The first round and industrial support effects are jointly known as the "*production induced effects*". The sum of the *production induced effects* and the *initial effect* is termed the "*simple multiplier*".

Finally, the earnings associated with the employment supported by the direct and production induced effects provides for the upstream effect via household spending. For example, workers employed in a given project would spend their earnings on various household goods and services, thereby affecting other persons working in the industries that supply those household goods and services. This is known as the "*consumption induced effect*." The consumption induced effects are somewhat tentative and therefore should be excluded from I-O employment multiplier analyses of NSW Government actions. The sum of the *consumption induced effect* and the *initial* and *production induced effects* is termed the "*total multiplier*."

As the estimates for employment supported are based on annual spending and annual multipliers, the estimates relate to annual full-time equivalent jobs. The I-O employment multiplier approach does not provide any information on the timing of such jobs. In practice it takes time for government spending to flow through the economy.

The NSW Treasury Research and Information Paper *Employment Support Estimates–Methodological Framework* (TRP09-3) provides further details about I-O modelling.