

# *Matrix of Skills Transferability*

**Final Report**

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# ***1. Introduction***

## **1.1 Background**

The determination of skill or occupational transferability has been a priority of occupational analysts and researchers since the 1950's. Users of occupational information frequently demand a means of identifying skills that are portable from job to job and from occupation to occupation. Pressures resulting from the rapidly changing workplace and the parallel pressures on workers have led to an even more urgent requirement. Effective human resource utilisation requires, more than ever, that we understand what skills and knowledge make it possible for workers to apply themselves in a variety of settings with a variety of tasks. This represents an extremely complex challenge.

A key element of the model designed to identify potential employment opportunities for workers in different occupations is the development of a matrix of skill transferability. The outcome of this segment of the model has been a completed matrix of skill transferability between selected occupations from the National Occupational Classification (NOC). Ratings identify possible paths of mobility between occupations. From this completed matrix, the coefficients of skill transferability for the model have been derived.

## **1.2 Related Work In Other Countries**

### **1.2.1 The United States**

O\*NET replaces the *Dictionary of Occupational Titles* and offers a dynamic framework for exploring the world of work. The O\*NET database identifies, defines, and describes the comprehensive elements of job performance. It contains hundreds of information units on requirements, worker attributes, and the content and context of work, capturing what people do as functions of their roles within organizations. By examining and measuring the processes of work, O\*NET data allow users to profile similarities and differences across occupations.

The framework that organizes O\*NET data is a skills-based structure called the Content Model. The Content Model classifies data into six domains, or "windows" that look into all aspects of the workplace, from the attributes of occupations to the characteristics of people who do the job.

O\*NET currently contains information developed by job analysts using the O\*NET skill-based structure. Future data will come directly from workers and employers themselves, describing the work they do, the skills they need, and the knowledge they use on the job.<sup>1</sup>

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<sup>1</sup> Basic Information adapted from the United States Department of Labor Website. <http://wdr.doleta.gov>

The Internet version of O\*NET allows users to profile their skills and relate them to jobs. For each job it is possible to view “Related Occupations”. The related occupations are developed on the basis of similarities and differences of profiles developed for the content model. The following table illustrates the related occupations for Mechanical Engineering Technicians and Family and General Practitioners.

<b>Occupation</b>	<b>Mechanical Engineering Technicians</b>	<b>Family and General Practitioners</b>
Related occupations	Model Makers, Metal and Plastic	Veterinarians
	Machinists	Physician Assistants
	Marine Engineers	Podiatrists
	Marine Architects	Registered Nurses
	Mechanical Inspectors	Surgeons
	Petroleum Engineers	
	Precision Devices Inspectors and Testors	
	Materials inspectors	
	Mining and Geological Engineers	

## 1.2.2 France

France has a similar system to the United States for comparing occupations to one another. The French occupational system (ROME) includes comprehensive descriptions of occupations based on a number of factors or elements. It also includes a feature called “Aire de mobilité”. The automated system allows users to view this feature for each occupation. It can be translated as “areas of mobility”. The occupations are arranged within a circle. The occupation of origin is at the center and the related occupations are arranged within the circle based on a statistical analysis of the commonality of their cognitive requirements. These factors include “Processes Followed” (e.g. methodical, creative, diagnostic etc.; “Knowledge” (including fields such as construction and levels of achievement required); “Field of Work” (e.g. medical); “Delegation” required; and “Interaction with others”.

The results for Medecin (Medical Practitioner) are as follows:

1. Dental Surgeon;
2. Specialist Nurse.

Also included in the graphic for Medecin (but more distant) were psychologist, medical biologist, veterinarian, dietitian, and optician. The list bears at least some similarity to the list derived from O\*NET.

In both the American and French systems the “closeness” or “relatedness” of occupations is theoretical and based on an analysis of similarities across occupations on a series of rated psychosocial factors. Neither labor market practices nor educational requirements are included in the analysis.



## ***2. Methodology***

### **2.1 Overview of Methodology**

A key element of the model is the development of a matrix of skill transferability. In comparing 4 digit occupations to one another a judgment has been made regarding the potential transferability of skills and knowledge between the occupations. If the skills and knowledge from a given occupation were not sufficiently related to allow occupational mobility between it and another occupation, we assume a value of zero. Conversely, potential mobility from one occupation to another is indicated by a one.

The work involved identifying verifiable overlap between the knowledge and/or skills of individual occupations.

#### ***2.1.1 The Role of Skills and Knowledge***

To objectively estimate occupational mobility, it is important to focus on the nature of the work. Knowledge, occupation-specific skills and generic or basic skills are the key, often overlapping elements in this equation.

Knowledge can be of an academic nature (e.g. astrophysics) or of a tacit nature (knowledge acquired informally, on the job). “Industry” or “work place” experience often reflects tacit knowledge. Both kinds of knowledge must be considered in comparing occupations with an eye to estimating inter-occupational mobility.

Occupation-specific skills are skills that are required to perform the work of a particular occupation or set of occupations. “Performing surgery” is an example. While knowledge of anatomy is important, a very specific set of routines and competencies are also critical.

Generic or basic skills are those that underline and facilitate job performance; the learning of other skills; and adaptability to workplace change. They correlate highly with level of education and include such elements as reading, writing, oral communication, problem solving, numeracy and interpersonal skills.

#### ***2.1.2 The Role of Labour Market Hiring Practices***

Determining potential inter-occupational mobility also requires consideration of labour market practices. This includes taking into account labour market hiring practices such systems of internal progression.

For example, in some industries workers are hired at the least skilled level, and are promoted internally to increasingly more skilled work. In such human resource management systems, little or no direct outside hiring is undertaken at the more skilled levels into which employees of the firm can be promoted.

This is often the case in the manufacturing and processing, mining and forest industries. A similar system is sometimes applied in administrative and clerical work.

In practically all cases, supervisors are hired from within a company. Therefore, predicting mobility to supervisory occupations would be inappropriate.

### **2.1.3 The Process**

Our methodology for the estimation of occupational mobility is quite different from the approaches underway in other countries. In the United States and France emphasis has been on the analysis of a variety of psychosocial rated factors. The similarities between occupations represent theoretical inter-occupational mobility.

Other international research related to occupational mobility has centred on the identification and transferability of basic, essential or key skills between school and work and between jobs or occupations.

Since this model required a measure of likely or at least possible inter-occupational mobility, theoretical similarities alone are not appropriate. We have instead attempted to estimate mobility based on a more concrete criteria.

To arrive at these judgments, the following general methodology adopted.

The most reliable source of qualitative information is the National Occupational Classification (NOC) and its related sub- systems. As such, it was chosen as the primary source of information for this study. Inter-occupational mobility has been estimated based on an analysis of relevant occupational information from the NOC, the Career Handbook, and the JOBSCAN Skill Profiles.

These sources were supplemented by a review of relevant data sets. In this methodology, the data sets were used as a source of *qualitative* information, illuminating and confirming Canadian paths of inter-occupational mobility.

There are however, a number of problems surrounding the adequacy of occupational information and data. The difficulty in finding the information needed to make the required judgment is a source of concern. This is especially the case for occupations requiring little formal education or training.

An eclectic approach was developed to approach these problems. This is discussed in section II.6.Procedures. However, before defining the process more clearly, an overview of the information available and the issues that limit our ability to make the required judgments may be helpful.

## **2.2 The National Occupational Classification (NOC)**

### **2.2.1 Overview**

The National Occupational Classification (NOC) provides an overall structure and framework for all components of the occupational system as well as descriptions of the tasks and educational and or training requirements for each occupation. Most NOC 4-digit occupations are clusters of jobs that share a certain commonality with regard to knowledge and skills. One of the design principles of the NOC, in addition to skill level and skill type, is occupational mobility.

The NOC classifies more than 25,000 job titles in the Canadian labour market. These jobs are categorized into three levels: 26 major groups, 139 minor groups and 522 unit groups.

The 26 major groups are identified by two-digit numbers. The 139 minor groups are identified by three-digit numbers. These groups, in turn, are further broken down into four-digit unit groups.

The 522 unit groups, identified by four-digit numbers, provide the detailed information found in the NOC. Each unit group has information on employers, examples of occupational titles, main duties, employment requirements and any pertinent additional information.

In the NOC, skill type is broadly defined as type of work. It can be a function (management, clerical, sales) or a subject matter, (science, health, social science, culture, skilled trade) or industry (primary industry, manufacturing). The element believed to best represent the “sense” of the occupational cluster was chosen as its defining element. It is partly in this sense that the NOC is seen as a skill based occupational system.

#### **NOC Skill Types:**

0. Management;
1. Business, Finance & Administration;
2. Natural and Applied Science, and Related Occupations;
3. Health Occupations;
4. Occupations in Social Science, Education, Government Service and Religion;
5. Occupations in Art, Culture, Recreation and Sport;
6. Sales and Service;
7. Trades and Skilled Transport and Equipment Operators;
8. Occupations unique to Primary Industry;
9. Occupations unique to processing, manufacturing, and utilities.

There are four skill levels in the NOC. Each major, minor and unit group is assigned to a skill level. Skill level in the NOC is defined as the amount and type of education and training required to enter and perform the duties of an occupation. In determining the skill level, the experience required for entry and the complexity and responsibilities typical of an occupation were also considered.

<b>Table 1 NOC Skill Level Criteria</b>	
<b>Education/Training</b>	<b>Other</b>
<b>Skill Level A</b> <ul style="list-style-type: none"> <li>• University degree (bachelor’s, master’s or post-graduate)</li> </ul>	
<b>Skill Level B</b> <ul style="list-style-type: none"> <li>• Two to three years of post-secondary education at community college, institute of technology or CEGEP or</li> <li>• two to four years of apprenticeship training or</li> <li>• three to four years of secondary school and more than two years of on-the-job training, training courses or specific work experience</li> </ul>	<ul style="list-style-type: none"> <li>• Occupations with supervisory responsibilities are assigned to Skill Level B</li> <li>• Occupations with significant health and safety responsibilities (e.g., fire fighters, police officers) are assigned to Skill Level B</li> </ul>
<b>Skill Level C</b> <ul style="list-style-type: none"> <li>• One to four years of secondary school education</li> <li>• Up to two years of on-the job training, training courses or specific work experience</li> </ul>	
<b>Skill Level D</b> <ul style="list-style-type: none"> <li>• Up to two years of secondary school and short work demonstration or on-the job training</li> </ul>	

Since NOC will be the primary source of information in this study, a description of its conceptual and methodological basis will help to clarify its application in this context.

## **2.2.2 Conceptual Basis**

NOC represents a new approach to occupational classification. The classification structure of the previous system, the Canadian Classification and Dictionary of Occupations (CCDO), was rather like that of an encyclopedia; it provided a logical organization of related occupations but did not differentiate between skill levels. The structure was designed to provide a means of systematically organizing and coding jobs and occupations.

The objective for the NOC was more ambitious. The NOC developers wanted the new classification to provide a map of the world of work that would help labor market analysts, researchers, counselors, students and educators understand, not just the content of occupations, but the relationships between occupations. These relationships were to be based on empirical rather than theoretical observations.

The NOC is based on four principles of classification: skill level, skill type, occupational mobility and industry. Every unit group (four-digit level) was designed on the basis of skill level and type of work. The purpose of this design was that unit groups could then be sorted into a variety of classifications. For example, a purely skill-type organization

would be possible as would one based on skill level<sup>2</sup>. Structures built on combinations of skill level and skill type were also feasible. For example, a classification very similar to International Standard Classification of Occupations 1988 (ISCO 88) can be developed using this approach.

The design principle regarding ‘occupational mobility’ was as follows: ‘mobility between occupations within a unit group should be greater than mobility to any other unit group’. Further, the placement of unit groups within the skill types of the Matrix was designed to illustrate paths of occupational mobility.

‘Industry’ was applied, as a classification principle, when occupations could be best understood within that context. This was the case for production workers in manufacturing and processing occupations as well as for workers in agriculture, fishing, mining and forestry. There is little occupational mobility outside the industry and career paths are characterized by movement within a specific industry and often within a company.

### **2.2.3 NOC Methodology**

The NOC was based on extensive occupational research. The primary methodologies employed were surveys and industry studies. These studies concentrated not on describing jobs but on determining the knowledge and skill requirements, paths of progression and occupational mobility, and the clustering of jobs based on these principles.

Industry studies involved establishment interviews to identify the full range of production and technical jobs in manufacturing, resource extraction, processing, transportation, and utilities sectors. A variation on the industry methodology was also used to study many white-collar occupations; especially those occurring in internal labor markets.

It was the collection of this occupational information regarding movements between occupations that allowed the NOC to introduce and apply the principle of occupational mobility.

Based on this extensive research, The NOC was constructed, initially at the unit group level with pieces of the overall structure developed somewhat concurrently to reflect the aggregation of the unit groups. The NOC Matrix provides a framework for understanding the functioning of the world of work.

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<sup>2</sup> Statistics Canada’s version of the NOC (SOC91) consists of the grouping of the NOC minor groups into major groups and sub major groups without regard to skill level. For example, a sub major group might include all hospitality and accommodation occupations. This aggregation would include minor groups from 3 skill levels.

## **2.2.4 The Impact of NOC Methodology on Matrix of Occupational Mobility**

The NOC Skill Types at the broadest level were designed to reflect labor market realities such as occupations dominated by systems of internal progression or occupations dominated by particular types of university or college training.

The importance for this study is that information regarding potential occupational mobility is often not explicit, but rather inherent within the NOC structure. Also, movement between unit groups can be expected to be less prevalent than in traditional occupational classifications.

In some cases, the NOC provides direct information regarding occupational mobility under the title “Additional Information”.

## **2.3 The NOC-Based Systems**

NOC occupational descriptions were built at the 4-digit level. The extended occupational system includes skill-sets for each occupation, profiles of essential skills, entry requirements, aptitudes and interests, physical activities and occupational standards.

### **2.3.1 The Career Handbook**

The Career Handbook, which is organized according to the NOC structure, relates work to people by providing ratings and descriptions of worker traits such as aptitudes, interests and Data People Things (DPT). These rating that can be used to examine comparability across occupations, but does not deal with occupational mobility directly. Aptitude ratings have been reviewed in the process of this study.

To meet statistical requirements, sometimes unit groups that were originally developed as distinct occupations for the NOC were combined to create a larger unit group. The Career Handbook has sub-divided these 4 digit NOC groups. For Example, NOC 5121 has 3 sub-sections in its “Main Duties” – Creative Writers, Technical Writers and Copywriters. In many cases, the NOC provides separate “Employment Requirements” for these sub-groups. These sub-sections are given a unique identifier. Eg. 5121.1, 5121.2 and 5121.3 in the Career Handbook.

This 5<sup>th</sup> level of the NOC is useful in determining the heterogeneity of unit groups. A modified version of this system is used by Immigration in the present General Open List and the coding and assessment of immigrants.

### **2.3.2 JOBSCAN Skill Profiles**

JOBSCAN and the Electronic Labour Exchange (ELE) contain a comprehensive set of skills and knowledge for each NOC occupation. However, comparisons of skills and knowledge between occupations is time consuming and not always possible since the skill and knowledge elements have not yet been ‘rationalized’ across occupations, i.e. the same skill may be referred to by a different word in different checklists, and even more confusing, the same word may mean different things in different contexts.

## **2.4 Quantitative Sources of Information**

### **2.4.1 The National Graduate Survey (NGS)**

The National Graduate Survey and its Follow-up Survey provide the only direct empirical measure of inter-occupational mobility. It provided a major source of specific qualitative information about mobility from one occupation to another. It also provides information regarding the dispersion of graduates from Fields of Study.

Issues of coverage and sample size as well as measurement error have forced limits on its applicability in this study.

### **2.4.2 The Census and Field of Study (FOS)**

The Census does not allow measurement of occupational mobility. However, in some cases, it was possible to substitute Field of Study for occupation. This is possible when there is a direct, one to one relationship between Field of Study and occupation.

Many occupations are not directly related to a Field of Study. In these cases it was sometimes useful to examine the distribution of Level of Education and of Field of Study within NOC unit groups for which no other directly related empirical documentation was available.

## **2.5 Limitations Related to Occupational Information**

### **2.5.1 Structural Limitations of the NOC**

One of the most serious problems related to the use of the NOC is the fact that not all unit groups represent one occupation. This is an extremely important factor when attempting to assess potential movement from one occupation to another. If a unit group contains several distinct occupations it may be impossible to predict in which other unit groups workers might be able to find employment. For example, a heterogeneous unit group such as 4161 Natural and Applied Science Police Researchers includes such unrelated occupations as Ergonomists, Occupational Hygienists, Patent Agents and Science Policy and

Program Officers. Given that these occupations are unique, with little overlap between them, it is impossible to predict a common set of occupations to which they might be mobile.

Recognition of the fact that the NOC unit groups are not uniformly homogeneous has had a significant impact on this study. It was one of the primary means adopted for determining if a unit group was appropriate for inclusion in the study.

NOC unit groups can be characterized by their content into approximately five categories<sup>3</sup>.

Category 1: Unit groups that are composed of a single occupation with no significant specializations.

Category 2: Unit groups that contain either specialization or variations on the core occupation. (e.g Registered nurses, Psychologists, etc.)

Category 3: Unit groups that contain 2-4 distinct occupations (e.g., Curators and Conservators; Air Pilots, Flight Engineers and Flying Instructors; Audiologists and Speech-Language Pathologists; Dispatchers and Radio Operators).

Category 4: Unit groups that contain 5 or more distinct occupations, (e.g., Specialist Physicians; Other Engineers; Natural and Applied Science Policy Researchers, Consultants and Program Officers; Technical and Skilled Occupations in Motion Pictures, Broadcasting and the Performing Arts; Ministers of Religion).

Category 5: Unit groups that contain a collection of jobs (i.e., Machine and Process Operators – Mineral and Metal Processing; Papermaking and Finishing Machine Operators; Hide and Pelt Processing Workers; Fish Plant Workers).

In general, occupational groups in Categories 1 and 2 can be expected to represent a single occupation. In such cases, estimation of occupational mobility can be made without complication at the unit group level.

If a 4-digit NOC group is heterogeneous such as those in Categories 3 and 4, a single judgment may not be possible. For example, NOC Unit Group 4169 includes a wide variety of classical and social science occupations, e.g. archaeologist, geographer, historian linguists, and sociologist. The opportunities for mobility may be quite different for each occupation within the group. Such heterogeneity makes the estimation of occupational mobility problematic.

In the case of Category 5, estimation of occupational mobility may not be possible, unless the 4-digit group is part of an internal progression. For example, we know that Labourers in Textile Processing (NOC 9616) can be expected to progress to any unit group in Machine Operators and Related Workers in Textile Processing (944). This application of Category 5 will not be particularly useful in this study because most internal progressions commence with Skill Level C and sometimes D.

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<sup>3</sup> These categories are based on unpublished HRDC research and development documents related to the NOC.



## 2.5.2 *Information Related to Occupational Mobility*

There is no direct, uniformly available, information regarding the potential mobility between occupations. Judgments have been made based on an analysis of available information regarding the overlap of knowledge and skills and labour market hiring practices.

The following elements of the NOC and related systems have been used to collect evidence:

- **Employment Requirements** - Employment Requirements are usually presented in terms of education and training, and sometimes specific experience. Often the Employment Requirements will identify differences that would hinder movement between occupations. In other cases, they identify opportunities for mobility.
- **Additional Information:** This category in the NOC sometimes identifies opportunities for occupational mobility. For example, in NOC 2241 Electrical and Electronics Engineering Technologists and Technicians it states, “There is mobility to other related occupations such as technical sales, electronics service technicians, instrument technicians and avionics technicians. Progression to managerial positions in engineering, production or operations is possible with experience”. Unfortunately, this category has been developed for a minority of NOC groups.
- **Career Handbook:** The comparison of Aptitude Profiles may be useful in estimating potential mobility.
- **Skill Profiles:** Skill Profiles allow for a comparison of the specific knowledge and skill requirements within occupations.

## 2.5.3 *Lack of Appropriate Data*

The National Graduate Survey is the only data source that measures inter-occupational mobility directly. It has the following limitations:

- This study is limited in scope –it measures only the occupational mobility of graduates of post secondary and vocational study;
- The sample is not large and analysis at the 4-digit level is often not possible;
- Only one measurement using the NOC Structure is available (the 1992 National Graduates survey and the 1995 Follow-up Survey).

On the positive side, measurement error, though an issue, is likely a less serious problem than in the Census. The NGS is an established sample of graduates whose information is collected by telephone interview. Field of Study (FOS) and Level of education are preset based on information from the educational institutions.

As mentioned previously, because of the limited data that measures mobility directly, it was proposed that Field of Study be used under certain conditions. Use of FOS considerably increased the data sources.

The NGS has dispersion by FOS, by 5 levels of education (Ph. D., Masters, Bachelor, College and Trade Vocational). The Census is coded to level of education and field of study as well as occupation.

For Field of Study to be appropriate it must be possible to identify a one to one relation between Field of Study and Occupation. In trying to determine this we can ask the following: “Is it likely that we will know the opportunities for occupational mobility of persons in occupation ‘x’ by knowing what happens to graduates of Field of Study ‘y’?”

In such cases Field of Study and occupation must be contained within exactly the same scope: E.g. “Economist” to “Field of Study - Economics”, not “Other Nursing” to “Nurses Aide”. Further the Field of Study must provide an essential link with the occupation such as for example, the link between professional degrees in law and medicine and lawyers and doctors. It cannot be indirect as in the case of Field of Study “Commerce” and NOC occupation 1111- Financial Auditors and Accountants. There may be a link, but Commerce cannot be seen as a proxy for Accountant.

Where possible, NOC occupations have been coded to FOS to allow for additional NGS analysis, and for the use of the Census. The level of education recorded in NOC Entry Requirements was used to determine the appropriate level for each Field of Study and for analysis of NGS Mobility Data. For example, the appropriate education level for Psychologists is a Masters degree or a Ph.D. The appropriate level for Engineers is a Bachelor degree. The appropriate level for Engineering Technologists is College; not a Bachelor degree, even though there are many working as technologists with Bachelor degrees.

## **2.6 Procedures**

### **2.6.1 *Blueprint***

The first step in the development of the Skills Transferability Matrix was the Blueprint. This was in fact a very detailed plan. It specified a strategy for determining inter-occupational mobility for each NOC unit group based on analysis of the data and information available. This was necessary since no common strategy could be applied to all occupations.

There are 85 unit groups at the Professional Level (Skill Level A) in the NOC and 257 unit groups at the Skilled/Technical Level (Skill Level B). The Blueprint identified the sources of occupational information for each occupation as well as specific data sets and fields and levels of study where appropriate.

Advantages of this approach included the following:

- It provided a means of testing the adequacy of the methodology;
- Problem areas were identified early in the project;
- It ensured a consistent approach across occupations;

- It provided a basis for the development of detailed data specifications;
- It helped to identify problematic NOC unit groups;
- The plan provided the team with a preview of the issues related to occupational information.

The Blueprint included the following items of information for each occupation. They are variable and important in determining a strategy:

### **Career Handbook Sub-divisions**

The Career Handbook has sub-divided many 4 digit NOC groups. This 5<sup>th</sup> level of the NOC assists us in determining the heterogeneity of unit groups.

### **Type of NOC group**

The NOC unit groups, the most detailed level of aggregation useful for the model, are not uniformly homogeneous. (See discussion in Section II.5.1 *Structural Limitations of the NOC*). Each unit group has been assigned a category that describes the level of heterogeneity found within the unit group. Heterogeneity refers to the degree to which the occupations and jobs with a unit group differ from one another in terms of knowledge, skills, and actual labour market mobility.

### **Field of Study (FOS)**

Where possible, NOC occupations have been coded to FOS to allow for additional National Graduate Survey (NGS) analysis, and for the use of the Census.

### **Level of Education**

The NOC level of education is used to determine the appropriate level of education for an occupation when developing tables from the NGS.

### **The NGS**

This Blueprint identifies specific data sets and Fields of Study, where appropriate. The NGS FOS is coded to the COPS 2 digit fields of study only.

### **The Census**

The Census is coded to Field of Study at the 5 digit level. This allows for a level of detail not possible in the NGS. The Blueprint identifies all appropriate fields of study.

## **2.6.2 Worksheet For Each Occupation**

The next step was the development of a worksheet for each occupation whose purpose was to bring together all relevant information. These Worksheets for each occupation are available as an appendix to this document.

The information identified in the NOC, the Career Handbook, and the Blueprint was assembled and reviewed. Based on this information, a recommendation was made regarding which occupations, if any, should be identified as suitable “substitute” occupations. In some cases, especially where the unit group is very heterogeneous, it was recommended that the unit group be deemed unsuitable for inclusion in the study.

These recommendations make up the **Matrix of Skills Transferability**.

The worksheets follow a standard format for each unit group. For each Major Group, a brief outline of the characteristics of the Major Group was developed.

The standard format for each Unit Group Worksheet is outlined on the following pages:

### **NOC Code and Title**

#### **Lead Statement**

The lead statement is important in understanding the scope and work responsibilities within an NOC 4-digit group. It is taken directly from the National Occupational Classification (NOC).

#### **Employment Requirements**

Employment Requirements are usually presented in terms of education and training, and sometimes specific experience. Often the Employment Requirements will identify differences that would hinder movement between occupations.

Employment Requirements are critical for determining the flexibility of entry into the occupation. This information is taken directly from the NOC.

#### **Additional Information**

Additional Information is found in the NOC for some occupations. It often comments on opportunities for occupational mobility. This information will be taken directly from the NOC.

#### **Blueprint Summary**

The Blueprint Summary will reproduce the following categories of information from the Blueprint. This table provides key information for determining the course of enquiry.

<b>Career Handbook Sub-division</b>	<b>Type of NOC Group</b>	<b>Level of Education Required</b>	<b>Field of Study</b>	<b>Number of Grads: NGS FOS 1992</b>	<b>Number of Grads: NGS Mobility 1992</b>

#### **Aptitude Profile**

The comparison of Aptitude Profiles<sup>4</sup> may be useful in estimating potential mobility. The following description aptitude is provided in the Handbook:

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<sup>4</sup> To describe aptitudes, the Career Handbook uses the following scale based on the normal curve representing the Canadian labour force. For example, 1 indicates the level of aptitude that applies to the top 10 percent of the working population.

- 1 The highest 10 percent of the working population
- 2 The upper third, exclusive of the highest 10 percent
- 3 The middle third of the working population
- 4 The lowest third, exclusive of the lowest 10 percent
- 5 The lowest 10 percent of the working population

“An individual’s overall capacity to learn the skills needed to perform job duties is based on his or her specific aptitudes for acquiring information and transforming it into action.”

G <sup>5</sup>	V	N	S	P	Q	K	F	M

### Skill Profiles

Skill Profiles were used to compare the specific knowledge and skill requirements between occupations. This category was included only when relevant.

### Review Of Data

Where numbers permit, tables were prepared to display NGS mobility tables at each appropriate level of education. The minimum number was normally 100.

Similarly, tables were prepared to display the dispersion of Field of Study (FOS) from the NGS, where there is an FOS that can be considered a proxy for the occupation and where numbers permit. (100). An example from Unit Group 1111, Financial Auditors and Accountants is displayed below:

### NGS FOS Dispersion

#### FOS – Accounting (SFM 14)

College N=897

B011(1111) Financial auditors and accountants	375
B531(1431) Accounting and related clerks	170
B111(1231) Bookkeepers	56
G211(6421) Retail salespersons and sales clerks	30
B513(1413) Records and file clerks	26

### Recommendations:

This section identifies substitute or alternative occupations recommended for inclusion in the model for each occupation under study.

The Type of NOC group and the implications were outlined. In some cases it was not possible to make recommendations regarding alternative occupations because of the nature of the unit group. In such cases it was recommended that the unit group be excluded from the study.

## 2.6.3 Strategies for determining Occupational Mobility

The following strategies and examples illustrate the procedures used for making a judgment about skills transferability. Every effort has been made to apply these strategies consistently across all occupations.

<sup>5</sup> G= General Ability, V= Verbal Ability, N= Numerical Ability, S= Spatial Perceptions, P= Form Perception, Q=Clerical Perception, K= Motor Co-ordination, F= Finger Dexterity, M= Manual Dexterity

- The occupations to which skills transfer is potentially possible ('destination' occupations) from a given occupation ('original' occupation) are selected on the basis of some observed commonality in the knowledge and skills required for the original occupation and for the destination occupations. In many cases the Skill Level for the destination occupations is a lower Skill Level than that for the original occupation.

**Examples:**

The knowledge and skills acquired in the study of biology and medicine are required for employment as General Practitioners and Family Physicians (NOC 3111); thus it is reasonable to assume that individuals working as General Practitioners and Family Physicians could work as Medical Technologists (NOC 3211) with little additional training if more appropriate medical work was not available.

Similarly, it is reasonable to assume that because of their knowledge of accounting, Financial Auditors and Accountants would have the skills necessary to work as Bookkeepers.

- Occupations that require considerable retraining of individuals in a given original occupation are not included as destination occupations for that occupation.

**Example:**

Data from the National Graduates Survey (NGS) show that many graduates in mathematics at the Bachelor's level work as Financial Auditors and Accountants. However, it does not seem reasonable to assume that this transfer can be attributed to the skills and knowledge developed in the study of mathematics; it is more reasonable to assume that it is the result of some additional training, either on-the-job or through additional courses. The unit group Financial Auditors and Accountants, is therefore not included as a destination occupation for the unit group Mathematicians, Statisticians and Actuaries.

Similarly, the unit group Secondary School Teachers is not considered to be a destination occupation for the unit group Painters and Sculptors since teacher training is normally required for teaching in secondary schools. There are some exceptions (such as some private schools), but it is not likely that they form a significant proportion of the labour market for Secondary School Teachers.

- In some cases there is a significant overlap between the skills or knowledge found in two occupations or between the components of two occupations. Since this overlap does not necessarily apply to all components of each occupation, the linkages were noted but no points were assigned.

**Examples:**

The unit group Chemists is likely to be related to the unit group Geologists, Geochemists and Geophysicists because of some overlap in the study of geochemistry. Similarly, the unit group Physicists and Astronomers may be related to the unit group Biologist and Related Scientists, which includes Biophysicists. Note that it is difficult to determine the significance of such overlap without further study.

There is a significant skill overlap between construction electricians and industrial electricians. However, it does not allow for substitutability and no point has been assigned for the model.

- It seems reasonable, in general, to assume that a skills and knowledge overlap is more likely to affect the potential transferability from a general occupation to a highly specialized occupation than *vice versa*. In the latter cases no points are given.

**Examples:**

In the example above, it was argued that it is reasonable to assume that the occupation Chemists is related to the unit group Geologists, Geochemists and Geophysicists. The assumption here is that some Chemists would be able to work as Geochemists because of the skills and knowledge acquired in the study of geochemistry. Note, however, that the converse is not assumed: thus it is not assumed that transfer from the unit group Geologists, Geochemists and Geophysicists to the unit group Chemists is as likely.

Similarly, it is assumed that there is a link between the unit groups Mechanical Engineers and Aerospace Engineers since (as noted in the NOC) the study of mechanical engineering can be required for Aerospace Engineers. However, the converse (that there is potential transferability from the occupation Aerospace Engineers to the occupation Mechanical Engineers) is not considered as strong a relationship.

- Employment in some occupations is sometimes open to individuals in a large number of other occupations.

**Examples:**

It is assumed that transfer is potentially possible from all engineering occupations to Drafting Technologists and Technicians (since it is reasonable to assume that all engineers must possess drafting skills and knowledge).

Similarly, depending on the product, employment in the unit group Technical Sales Specialists, Wholesale Trade is open to a variety of professional and technical workers.<sup>6</sup>

- In some cases a destination occupation is only one of several occupations in a heterogeneous unit group; in such cases, it would not be appropriate to identify the unit group as a destination occupation.

**Example:**

For example, it is likely that Physiotherapists will be able to perform the work of Massage Therapists. However, Massage Therapists are included in the unit group Other Technical Occupations in Therapy and Assessment, which includes at least 6 unrelated technical occupations. These other occupations have no particular commonality with

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<sup>6</sup> Originally it was assumed that transfer to the unit group Technical Sales Specialists, Wholesale Trade, is potentially possible from all scientific, technical and medical occupations. On further reflection, it was decided to remove this occupation from the matrix as it is very heterogeneous in terms of knowledge requirements and it was impossible to predict mobility outside the group.

Physiotherapists. Thus it is not reasonable to include this unit group as a possible destination for Physiotherapists. It has been removed from the study.

- In some cases there is a clear and significant overlap in skills and knowledge between occupations. However, if the destination occupation is part of an industry that is dominated by internal progression systems of hiring, the relationship is not recognized in the transferability matrix.

**Example:**

Petroleum, gas or chemical process operator seems a probable destination for Chemical Technologists and Technologists. However, the available information (NOC) states that process operators require several years of company experience. Therefore they are part of an internal progression system and not generally open to direct hiring outside the company.

- In identifying coefficients of skills transferability, the intention is to identify overlaps and similarities between the skills and knowledge in different occupations. Thus occupations, which are essentially open to individuals in many occupations and which require no specialized skills or knowledge, are not included as destination occupations.
- Decisions regarding potential mobility were based primarily on the information provided in the NOC<sup>7</sup>. Where possible it was confirmed by statistical data.

## **2.6.4 Occupations Excluded from the Study**

As noted above, the Model was designed to provide a basis for exploring the effects of skills transferability on the potential employment opportunities of new immigrants. For this reason, it was initially decided that the occupations in the Model would be restricted to the more highly skilled occupations, that is to those in Management, in Skill Level A and in Skill Level B. Occupations in Skill Level A are usually associated with possession of a university degree, while those in Skill Level B are usually associated with a college certificate or diploma, or formal apprenticeship.

### **Management Occupations**

When the analysis of skills transferability got underway, it was decided that it would not be appropriate to include Management occupations in the Model since they are grouped in heterogeneous NOC unit groups that vary both in Type of Work and in Skill Level. Moreover, since individuals working in Management occupations need not have a university degree or college diploma or certificate, these occupations have not been assigned a Skill Level in the NOC. It is therefore difficult to identify the coefficients of skills transferability for Management occupations.

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<sup>7</sup> Skill Profiles proved less helpful than originally hoped as knowledge tended to be very specific to the occupation and the skills were posed more generically. However, the latter were not sufficient to allow inter-occupational mobility.



The Model can be used in the application considered here for exploring the potential employment opportunities of new immigrants, so that it is appropriate to focus on new entrants to the labour market. Some work experience is usually required for a job in management, so that new entrants to the labour force (and immigrants) are unlikely to be offered jobs in Management occupations without some (Canadian) experience. For example, it is unlikely that an individual would be offered the job of Engineering Manager without previous experience as an Engineer.

### **All occupations in Skill Levels C and D**

Occupations in Skill Levels C and D have been excluded as ‘original’ or ‘destination’ occupations. This is because, as discussed above, the model is intended to focus on highly skilled and professional occupations.

### **Heterogeneous Unit Groups**

Heterogeneous groups are unit groups made up of a number of self-contained occupations or jobs. Often there is not sufficient commonality between these component occupations to allow for inter-occupational mobility within the group.

When the ‘original occupation’, i.e. the unit group, does not represent a unified collection of skills and knowledge it is impossible to determine common ‘destination’ occupations. Similarly, it is not possible to assign such a group as a ‘destination’ since this destination represents rather a ‘set of destinations’. Occupations such as Assessors, Valuers and Appraisers, Landscape and Horticultural Technicians and Specialists, Railway and Marine Traffic Controllers, Paralegal and Related Occupations have been excluded on this basis.

### **Functional Occupations with Heterogeneous Content**

Some unit groups represent one occupation, but an occupation within which specialization is the norm and mobility between specializations is impossible. Such unit groups include university professors, religious leaders, technical sales specialists and professional athletes.

### **Unit Groups dominated by Internal Progression Hiring**

Unit groups described as dominated by internal progression tend to be collections of jobs for which external hiring is not the norm. We did not believe that they constitute appropriate ‘destinations’ and they have been deleted from the study.

## ***2.6.5 Linkages that were identified but not incorporated in the Matrix of Transferability***

Some linkages between occupations were identified but were judged to be not sufficiently strong to merit a rating of potential occupational mobility. The following types of cases illustrate these circumstances:

- Where there is a very substantial commonality of skills and/or knowledge between two occupations that does not automatically allow for mobility between them. (e.g. construction and industrial electricians; crane operators and logging machine operators; tile setters and plasterers);

- Where there are significant and shared knowledge and skill sets shared by at least some specializations of two occupations. In these cases the boundaries between the occupations are not clear-cut and very similar work may be undertaken by workers with either occupational title. This overlap does not apply to all workers in either occupation. This is particularly prevalent in the scientific occupations.

More study would be required to identify the relevance of these observed similarities and overlaps.

## **2.6.6 The Impact of Methodology and Procedures on Results**

### **The Role of the NOC Structure**

We have been concerned about the effect on the model of the varying levels of disaggregation in the NOC. For example, Engineering professionals are distributed between 12 unit groups. It is well known that there is considerable mobility between engineering specializations. Recognition of this fact will lead to a larger number of options for Engineers than for other professions simply because engineering occupations are more disaggregated than other professions at the 4 digit level of the NOC structure. School teachers are distributed between two unit groups. Therefore the recognition of mobility between teachers can result in a maximum of 1 option whereas engineering occupations could receive 11 options.

We have come to the conclusion that because of inclusion of labor market share in the model, the effect of greater disaggregation will be counterbalanced by the smaller size of unit of groups.

### **The Exclusion of Supervisory and Management Occupations**

In terms of a mobility index, those occupations that are more likely to progress to management or supervisory positions will be disadvantaged. This includes most occupations at Skill Level B<sup>8</sup> as well as professionals known for their mobility to management, for example, accountants and engineers. Medical professionals many of whom are self-employed are probably less affected.

### **The Exclusion of Skill Level C**

Most potential occupational mobility identified in this study has been downward in terms of skill level. Professional scientists can become technologists or technicians, business professionals could become senior clerks, social workers can become welfare workers etc.

This downward trend can be identified at the trades and skilled occupations as well. For example, cooks could be fast food preparers; machinists could work as machining tool operators, and gas fitters as gas maintenance workers.

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<sup>8</sup> Team leaders or supervisors in professional occupations are included in the unit group.

However, since Skill Level C is outside the scope of the study the mobility index for trades, and some skilled and technical occupations will be lower than one might expect. This is because there are many parallels between Skill Levels B and C, especially in Business, Finance and Administration, Sales and Service, the Trades and Transportation Operators, Primary Industry and Manufacturing and Processing.

On the other hand, occupations at Skill Level C do not require extensive education, training, or experience and can be fairly easily filled by workers from a variety of backgrounds.



## 3. Results

### 3.1 Matrix of Inter-occupational Mobility

NOC Occupations	Occupations to which potential for skills transferability exists	Comments & Linkages (no points)
<b>PROFESSIONAL – BUSINESS, FINANCE AND ADMINISTRATION</b>		
1111 Financial auditors and accountants	1111; 1221; 1225; 1231	
1112 Financial and investment analysts	1112; 1122	
1113 Securities agents, investment dealers and traders	1113	
1114 Other financial officers	Eliminate unit group.	Very heterogeneous group
1121 Specialists in human resources	1121; 1223	
1122 Professional occupations in business services to management	1122	
<b>PROFESSIONAL – NATURAL AND APPLIED SCIENCES</b>		
2111 Physicists and astronomers	2111; 2212; 2147	2113; 2114; 2121
2112 Chemists	2112; 2211; 2212; 3211; 3212	2113; 2121
2113 Geologists, geochemists and geophysicists	2113; 2212	
2114 Meteorologists	2114; 2213	
2115 Other professional occupations in physical sciences	Eliminate unit group	Very heterogeneous group
2121 Biologists and related scientists	2121; 2221; 3211; 3212	2111; 2112
2122 Forestry professionals	2122; 2223	
2123 Agricultural representatives, consultants and specialists	2123; 2221	
2131 Civil engineers	2131; 2154; 2230; 2251; 2253; 2254	
2132 Mechanical engineers	2132; 2141; 2146; 2232; 2233; 2253	2252
2133 Electrical and electronics engineers	2133; 2147; 2241; 2242; 2253	
2134 Chemical engineers	2134; 2211; 2142; 2253	
2141 Industrial and manufacturing engineers	2132; 2141; 2233; 2253	
2142 Metallurgical and materials engineers	2142; 2211; 2212; 2253	
2143 Mining engineers	2143; 2212; 2253	
2144 Geological engineers	2144; 2212; 2253	
2145 Petroleum engineers	2145; 2211; 2212; 2253	
2146 Aerospace engineers	2146; 2232; 2253	2132
2147 Computer engineers	2133; 2147; 2162; 2163; 2241; 2242; 2253	
2148 Other professional engineers n.e.c.	Eliminate unit group	Very heterogeneous group
2151 Architects	2151; 2251; 2253	
2152 Landscape architects	2152; 2225; 2253	
2153 Urban and land use planners	1122; 2153	
2154 Land surveyors	2154	
2161 Mathematicians, statisticians and actuaries	2147; 2161; 2162; 2163	
2162 Computer systems analysts	1122; 2162; 2147; 2163	
2163 Computer programmers	2162; 2163	

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
<b>PROFESSIONAL – HEALTH OCCUPATIONS</b>		
3111 Specialist physicians	2221; 3111; 3112; 3211; 3212	
3112 General practitioners and family physicians	2221; 3112; 3211; 3212	
3113 Dentists	3113; 3221; 3222	
3114 Veterinarians	2221; 3114; 3211; 3212; 3213	
3121 Optometrists	3121; 3231	
3122 Chiropractors	3122	
3123 Other professional occupations in health diagnosing and treating	Eliminate Unit Group	Very heterogeneous group
3131 Pharmacists	2211; 2221; 3131; 3211; 3212	2112; 2121
3132 Dietitians and nutritionists	2211; 2221; 3132; 3211; 3212	
3141 Audiologists and speech-language pathologists	3141	
3142 Physiotherapists	2221; 3142; 3211; 3212	
3143 Occupational therapists	3143	
3144 Other professional occupations in therapy and assessment	Eliminate Unit Group	Very heterogeneous group
3151 Head nurses and supervisors	3151; 3152; 3233	1243
3152 Registered nurses	3152; 3233; 3234; 4212	1243
<b>PROFESSIONAL – SOCIAL SCIENCE, EDUCATION, GOVERNMENT ETC.</b>		
4111 Judges	Eliminate Unit Group	No direct hiring
4112 Lawyers and Quebec notaries	4112; 4211	
4121 University professors	Eliminate Unit Group	Highly Specialized – No mobility within unit group
4122 Post-secondary teaching and research assistants	Eliminate Unit Group	Highly Specialized – No mobility within unit group
4131 College and other vocational instructors	Eliminate Unit Group	Highly Specialized – No mobility within unit group
4141 Secondary school teachers	4141; 4142; 4215	
4142 Elementary school and kindergarten teachers	4141; 4142; 4215	
4143 School and guidance counsellors	4141; 4142; 4143; 4212; 4213; 4215	
*4151 Psychologists	4151; 4153; 4155; 4212	
*4152 Social workers	4152; 4153; 4155; 4212	
*4153 Family, marriage and other related counsellors	4153; 4212	
4154 Ministers of religion	Eliminate Unit Group	Highly Specialized – No mobility within unit group
4155 Probation and parole officers and related occupations	4155; 4212	
4160 Health and social policy researchers, consultants and program officers	Eliminate Unit Group	Very heterogeneous group
*4161 Natural and applied science policy researchers, consultants and program officers	Eliminate Unit Group	Very heterogeneous group
*4162 Economists and economic policy researchers and analysts	1112; 1113; 4162; 4163	

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
*4163 Economic development officers and marketing researchers and consultants	4163	
4166 Education policy researchers, consultants and program officers	4166	
4167 Recreation and sports program supervisors and consultants	4167; 5254	4212
4168 Program officers unique to government	4168	
<b>PROFESSIONAL – ART, CULTURE, RECREATION AND SPORT</b>		
5111 Librarians	5111; 5211	
5112 Conservators and curators	5112;	
5113 Archivists	5111; 5113; 5211	
5121 Writers	5121; 5122; 5123; 5124	
5122 Editors	5121; 5122; 5123; 5124	
5123 Journalists	5121; 5122; 5123; 5124	
5124 Professional occupations in public relations and communications	5121; 5122; 5123; 5124	
5125 Translators, terminologists and interpreters	5125	
5131 Producers, directors, choreographers and related occupations	5131	
5132 Conductors, composers and arrangers	5132; 5133	
5133 Musicians and singers	5133	
5134 Dancers	5134	
5135 Actors	5135; 5231	
5136 Painters, sculptors and other visual artists	5136	
<b>SKILLED – BUSINESS, FINANCE AND ADMINISTRATION</b>		
1211 Supervisors, General Office & Administrative Support Clerks	Eliminate Unit Group	Very heterogeneous group; internal progression
1212 Supervisors, Finance & Insurance Clerks	Eliminate Unit Group	Very heterogeneous group; internal progression
1213 Supervisors, Library, Correspondence & Related Clerks	Eliminate Unit Group	Very heterogeneous group; internal progression
1214 Supervisors, Mail and Message Distribution	Eliminate Unit Group	Very heterogeneous group; internal progression
1215 Supervisors, Recording, distributing & Scheduling Occupations	Eliminate Unit Group	Very heterogeneous group; internal progression
1221 Administrative officers	1221; 1222; 1241	
1222 Executive assistants	1221; 1222; 1241	
1223 Personnel and recruitment officers	1223	
1224 Property administrators	Eliminate Unit Group	Internal progression
1225 Purchasing agents and officers	1225	

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
1226 Conference and event planners	1221; 1222; 1226	
1227 Court officers and justices of the peace	Eliminate Unit Group	No direct hiring
1228 Immigration, unemployment insurance and revenue officers	1228; 4168	
1231 Bookkeepers	1231	
1232 Loan officers	1232	
1233 Insurance adjusters and claims examiners	1233; 6231	
1234 Insurance underwriters	1234; 6231	
1235 Assessors, valuers and appraisers	Eliminate Unit Group	Very heterogeneous & Specialized
1236 Customs, ship and other brokers	Eliminate Unit Group	Very heterogeneous & Specialized
1241 Secretaries (except legal and medical)	1241	
1242 Legal secretaries	1241; 1242	
1243 Medical secretaries	1241; 1243	
1244 Court recorders and medical transcriptionists	Eliminate Unit Group	Very heterogeneous & Specialized
<b>TECHNCIAL – SCIENCE AND APPLIED SCIENCES</b>		
2211 Applied chemical technologists and technicians	2211; 3212	
2212 Geological and mineral technologists and technicians	2212	2253; 2254
2213 Meteorological technicians	2213	
2221 Biological technologists and technicians	2221; 3212	2211; 3211
2222 Agricultural and fish products inspectors	Eliminate Unit Group	Very heterogeneous & product specific
2223 Forestry technologists and technicians	2223	2253; 2254
2224 Conservation and fishery officers	2224	
2225 Landscape and horticultural technicians and specialists	Eliminate Unit Group	Very heterogeneous
2230 Civil engineering technologists and technicians and construction estimators	2230; 2253; 2254; 2264	
2232 Mechanical engineering technologists and technicians	2232; 2253	2252
2233 Industrial engineering and manufacturing technologists and technicians	2233; 2253	
2234 Construction estimators (NOC only)	Eliminate Unit Group	NOC Only
2241 Electrical and electronics engineering technologists and technicians	2241; 2242; 2243; 2244; 2253	7246
2242 Electronic service technicians (household and business equipment)	2242	
2243 Industrial instrument technicians and mechanics	2243	
2244 Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	2242	
2251 Architectural technologists and technicians	2230; 2251; 2253; 2264	2230
2252 Industrial designers	2252; 2253	
2253 Drafting technologists and technicians	2253	
2254 Survey technologists and technicians	2254	



<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
2255 Mapping and related technologists and technicians	Eliminate Unit Group	Very heterogeneous group; little mobility within group
2261 Nondestructive testers and inspectors	Eliminate Unit Group	Very heterogeneous group; internal progression
2262 Engineering inspectors and regulatory officers	Eliminate Unit Group	Very heterogeneous group
2263 Inspectors in public and environmental health and occupational health and safety	Eliminate Unit Group	Very heterogeneous group; discipline specific
2264 Construction inspectors	2264	
2271 Air pilots, flight engineers and flying instructors	2271	
2272 Air traffic control occupations	2272	
2273 Deck officers, water transport	2273	
2274 Engineer officers, water transport	2274	
2275 Railway and marine traffic controllers	Eliminate Unit Group	Very heterogeneous group; no mobility within group
<b>TECHNICAL – HEALTH OCCUPATIONS</b>		
3211 Medical laboratory technologists and pathologists' assistants	3211; 3212	
3212 Medical laboratory technicians	3212	
3213 Animal health technologists	3213	
3214 Respiratory therapists and clinical perfusionists	3214	
3215 Medical radiation technologists	3215	
3216 Medical Sonographers	3216	
3217 Cardiology Technologies	3217	
3218 Electroencephalographic and other diagnostic technologists n.e.c.	3218	
3219 Other medical technologists and technicians (except dental health)	Eliminate Unit Group	Very heterogeneous group
3220 Dental Technicians & Laboratory Bench Workers (SOC 91 only; NOC: 3223 & 3412)	Eliminate Unit Group	SOC91 only – 2 skills levels combined – very heterogeneous
3221 Denturists	3221	
3222 Dental hygienists and dental therapists	3222	
3223 Dental Technicians (NOC only)	Eliminate Unit Group	NOC only
3231 Opticians	3231	
3232 Midwives and practitioners of natural healing	Eliminate Unit Group	Very heterogeneous group; no mobility within group
3233 Registered nursing assistants	3233	3234
3234 Ambulance attendants and other paramedical occupations	3234	
3235 Other technical occupations in therapy and assessment	Eliminate Unit Group	Very heterogeneous group

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
<b>TECHNICAL – SOCIAL SCIENCE, EDUCATION GOVERNMENT ETC.</b>		
4211 Paralegal and related occupations	Eliminate Unit Group	Very heterogeneous group; no mobility within group
4212 Community and social service workers	4212	
4213 Employment counsellors	1223; 4213	
4214 Early Childhood Educators (NOC only – counted with 6470)	Eliminate Unit Group	NOC only
4215 Instructors and teachers of disabled persons	4215	4141; 4142; 4212
4216 Other instructors	Eliminate Unit Group	Very heterogeneous group; no mobility within group
4217 Other religious occupations	Eliminate Unit Group	Very heterogeneous group; no mobility within group
<b>TECHNICAL – ART, CULTURE, RECREATION &amp; SPORT</b>		
5211 Library and archive technicians and assistants	5211	
5212 Technical occupations related to museums and galleries	Eliminate Unit Group	Very heterogeneous group; no mobility within group
5221 Photographers	5221	
5222 Film and video camera operators	5222	
5223 Graphic arts technicians	5223	
5224 Broadcast technicians	5224; 5225	
5225 Audio and video recording technicians	5224, 5225	
5226 Other technical occupations in motion pictures, broadcasting and the performing arts	5226; 5227	
5227 Support and assisting occupations in motion pictures, broadcasting and the performing arts	5226; 5227	
5231 Announcers and other broadcasters	5231	
5232 Other performers	Eliminate Unit Group	Very heterogeneous group; no mobility within group
5241 Graphic designers and illustrating artists	5223; 5241	
5242 Interior designers	5242	
5243 Theatre, fashion, exhibit and other creative designers	Eliminate Unit Group	Very heterogeneous group; little mobility within group
5244 Artisans and craftspersons	Eliminate Unit Group	Very heterogeneous group; little mobility within group
5245 Patternmakers - Textile, leather and fur products	5245	
5251 Athletes	Eliminate Unit Group	Very heterogeneous group; no mobility between sports

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
5252 Coaches	Eliminate Unit Group	Very heterogeneous group; no mobility between sports
5253 Sports Officials and Referees	Eliminate Unit Group	Very heterogeneous group; no mobility between sports
5254 Program leaders and instructors in recreation and sport	5254	
<b>SKILLED – SALES &amp; SERVICE</b>		
6211 Retail trade supervisors	Eliminate Unit Group	Very heterogeneous group; internal progression
6212 Food service supervisors	Eliminate Unit Group	Very heterogeneous group; internal progression
6213 Executive housekeepers	Eliminate Unit Group	Very heterogeneous group; internal progression
6214 Dry Cleaning & Laundry Supervisors	Eliminate Unit Group	Very heterogeneous group; internal progression
6215 Cleaning supervisors	Eliminate Unit Group	Very heterogeneous group; internal progression
6216 Other service supervisors	Eliminate Unit Group	Very heterogeneous group; internal progression
6221 Technical sales specialists, wholesale trade	Very heterogeneous group	Eliminate Unit Group
6231 Insurance agents and brokers	1233; 6231	
6232 Real estate agents and salespersons	6232	
6233 Retail and wholesale buyers	1225; 6233	
6234 Grain elevator operators	Occupation dominated by internal progression- Direct hiring unlikely	Eliminate Unit Group
6241 Chefs	6241; 6242	
6242 Cooks	6242	6252
6251 Butchers and meat cutters, retail and wholesale	6251	
6252 Bakers	6252	
6261 Police officers (except commissioned)	6261	
6262 Fire-fighters	6262	
6271 Hairstylists and barbers	6271	
6272 Funeral directors and embalmers	6272	

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
<b>SKILLED – TRADES &amp; TRANSPORT OPERATORS</b>		
7211 Supervisors, machinists and related occupations	Eliminate Unit Group	Very heterogeneous group; internal progression
7212 Contractors and supervisors, electrical trades and telecommunications occupations	Eliminate Unit Group	Very heterogeneous group; internal progression
7213 Contractors and supervisors, pipefitting trades	Eliminate Unit Group	Very heterogeneous group; internal progression
7214 Contractors and supervisors, metal forming, shaping and erecting trades	Eliminate Unit Group	Very heterogeneous group; internal progression
7215 Contractors and supervisors, carpentry trades	Eliminate Unit Group	Very heterogeneous group; internal progression
7216 Contractors and supervisors, mechanic trades	Eliminate Unit Group	Very heterogeneous group; internal progression
7217 Contractors and supervisors, heavy construction equipment crews	Eliminate Unit Group	Very heterogeneous group; internal progression
7218 Supervisors, printing and related occupations	Eliminate Unit Group	Very heterogeneous group; internal progression
7219 Contractors and supervisors, other construction trades, installers, repairers and servicers	Eliminate Unit Group	Very heterogeneous group; internal progression
7221 Supervisors, railway transport operations	Eliminate Unit Group	Very heterogeneous group; internal progression
7222 Supervisors, motor transport and other ground transit operators	Eliminate Unit Group	Very heterogeneous group; internal progression
*7231 Machinists and machining and tooling inspectors	7231; 7316	
*7232 Tool and die makers	7232	7231
7241 Electricians (except industrial and power system)	7241	7242; 7243
7242 Industrial electricians	7242	7241; 7243
7243 Power system electricians	7243	
7244 Electrical power line and cable workers	7244	
7245 Telecommunications line and cable workers	7245	
7246 Telecommunications installation and repair workers	7246	
7247 Cable television service and maintenance technicians	7247	
7251 Plumbers	7251	7252
7252 Steamfitters, pipefitters and sprinkler system installers	7252; 7316	7251
7253 Gas fitters	7253	

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
7261 Sheet metal workers	7261	
7262 Boilermakers	7262; 7263	
7263 Structural metal and platework fabricators and fitters	7263; 7262	
7264 Ironworkers	7264	
7265 Skilled Welders (NOC only)	Eliminate Unit Group	NOC only
7266 Blacksmiths & Die setters	7266	
7271 Carpenters	7271; 7293; 7295	7272; 7291
7272 Cabinetmakers	7272	7271
7281 Bricklayers	7281	7282; 7283
7282 Cement finishers	7282	7283
7283 Tilesetters	7283	7281; 7282; 7284
7284 Plasterers, drywall installers and finishers, and lathers	7284	
7291 Roofers and shinglers	7291	
7292 Glaziers	7292	
7293 Insulators	7293	
7294 Painters and decorators	7294	
7295 Floor covering installers	7295	
7311 Construction millwrights and industrial mechanics (except textile)	7311; 7316	7312
7312 Heavy-duty equipment mechanics	7312; 7316	
7313 Refrigeration and air conditioning mechanics	7313	
7314 Railway carmen/women	Eliminate Unit Group	Occupation dominated by internal progression- No direct hiring
*7315 Aircraft mechanics and aircraft inspectors	7315; 7316	
7316 Machine fitters	7316	
7317 Textile machinery mechanics & repairers	7317	
7318 Elevator constructors and mechanics	7318	
7321 Motor vehicle mechanics, technicians and mechanical repairers	7316; 7321	
7322 Motor vehicle body repairers	7322	
7331 Oil and solid fuel heating mechanics	7331	
7332 Electric appliance servicers and repairers	7332	
7333 Electrical mechanics	7333	
7334 Motorcycle and other related mechanics	7334	
7335 Other small engine and equipment mechanics	7335	
7341 Upholsterers	7341	
7342 Tailors, dressmakers, furriers and milliners	7342	
7343 Shoe repairers and Shoemakers	7343	
7344 Jewellers, watch repairers and related occupations	Eliminate unit group	Very heterogeneous group; little mobility within group
7351 Stationary engineers and auxiliary equipment operators	7351	7352
7352 Power systems and power station operators	7352	
7361 Railway and yard locomotive engineers	Eliminate unit group	Occupation dominated by internal progression- No direct hiring.

<b>NOC Occupations</b>	<b>Occupations to which potential for skills transferability exists</b>	<b>Comments &amp; Linkages (no points)</b>
7362 Railway conductors and brakemen/women	Eliminate unit group	Occupation dominated by internal progression- No direct hiring.
7371 Crane operators	7371	8241
7372 Drillers & Blasters	7372	
7373 Water Well Drillers	7373	
7381 Printing Press Operators	7381	
7382 Commercial divers	7382	
*7383 Other trades and related occupations (e.g. gunsmith, locksmith, etc.)	Eliminate unit group	Very heterogeneous group; little mobility within group
<b>SKILLED – PRIMARY INDUSTRIES</b>		
8211 Supervisors, logging and forestry	Eliminate unit group	Very heterogeneous group; internal progression
8221 Supervisors, mining and quarrying	Eliminate unit group	Very heterogeneous group; internal progression
8231 Underground production and development miners	Eliminate unit group	Very heterogeneous group; internal progression
8232 Oil & gas well drillers, servicers, testers & related workers	Eliminate unit group	UG dominated by internal progression. Outside hiring unlikely
8241 Logging machinery operators	8241	
8251 Farmers and farm managers	Eliminate unit group	Heterogeneous group
8252 Agricultural and related service contractors and managers	Eliminate unit group	Heterogeneous group; internal progression
8253 Farm supervisors and specialized livestock workers	Eliminate unit group	Heterogeneous group; internal progression
8254 Nursery and greenhouse operators and managers	Eliminate unit group	Heterogeneous group; internal progression
8255 Landscaping and grounds maintenance contractors and managers	Eliminate unit group	Heterogeneous group; internal progression
8256 Supervisors, landscape and horticulture	Eliminate unit group	Heterogeneous group; internal progression
8257 Aquaculture operators and managers	Eliminate unit group	Heterogeneous group; internal progression
8261 Fishing masters and officers	8261; 8262	
8262 Fishing vessel skippers and fishermen/women	8262	

NOC Occupations	Occupations to which potential for skills transferability exists	Comments & Linkages (no points)
<b>SKILLED - MANUFACTURING &amp; PROCESSING</b>		
9211 Supervisors, mineral and metal processing	Eliminate unit group	Very heterogeneous group; internal progression
9212 Supervisors, petroleum, gas and chemical processing and utilities	Eliminate unit group	Very heterogeneous group; internal progression
9213 Supervisors, food, beverage and tobacco processing	Eliminate unit group	Very heterogeneous group; internal progression
9214 Supervisors, plastic and rubber products manufacturing	Eliminate unit group	Very heterogeneous group; internal progression
9215 Supervisors, forest products processing	Eliminate unit group	Very heterogeneous group; internal progression
9216 Supervisors, textile processing	Eliminate unit group	Very heterogeneous group; internal progression
9221 Supervisors, motor vehicle assembling	Eliminate unit group	Very heterogeneous group; internal progression
9222 Supervisors, electronics manufacturing	Eliminate unit group	Very heterogeneous group; internal progression
9223 Supervisors, electrical products manufacturing	Eliminate unit group	Very heterogeneous group; internal progression
9224 Supervisors, furniture and fixtures manufacturing	Eliminate unit group	Very heterogeneous group; internal progression
9225 Supervisors, fabric, fur and leather products manufacturing	Eliminate unit group	Very heterogeneous group; internal progression
9226 Supervisors, other mechanical and metal products manufacturing	Eliminate unit group	Very heterogeneous group; internal progression
9227 Supervisors, other products manufacturing and assembly	Eliminate unit group	Very heterogeneous group; internal progression
9231 Central control and process operators, mineral and metal processing	Eliminate unit group	Very heterogeneous group; internal progression

NOC Occupations	Occupations to which potential for skills transferability exists	Comments & Linkages (no points)
9232 Petroleum, gas and chemical process operators	Eliminate unit group	Very heterogeneous group; internal progression
9233 Pulping control operators	Eliminate unit group	Very heterogeneous group; internal progression
9234 Papermaking and coating control operators	Eliminate unit group	Very heterogeneous group; internal progression



## **3.2 Observations Regarding NOC Major Groups**

### **3.2.1 Overview of Major Group 11 - Professional Occupations in Business and Finance**

Major Group 11 is made up of six unit groups, all of which are professional occupations associated with business. The following are some of the characteristics of these occupational groups.

- Educational and experience requirements are often flexible. In most cases graduates with a generally appropriate level and type of education are acceptable. Professional knowledge is characteristically obtained through experience and specialized training.
- This professional knowledge is often not relevant to other occupations in the group.
- An above average ability in General, Verbal and Numerical Abilities is required for these occupations.
- Probably, inter-occupational mobility will be vertical within Column 1 of the NOC Matrix. Lateral mobility to other columns of the matrix is unlikely, except for individuals with additional skills. For example, some accountants may have acquired a high level of computer related skills and might find employment in a computer related occupations such as 2162 systems analysts or 2163 computer programmers. In such cases, the mobility would be possible because of skills other than those required for the occupation of accountant. Therefore, this type of occupational movement would not be applicable for the model.
- Some unit groups are made up of a variety of occupations. As a result, predicting mobility will depend on the closeness of the relationship between occupations in the group. If the group is highly heterogeneous with only a minor commonality of skill and knowledge, one cannot expect to be able to predict universally appropriate alternate occupations.

### **3.2.2 Overview of Major Groups 21 – Professional Occupations in Natural and Applied Science Occupations**

Major Group 21 is made up of six minor groups and twenty-seven unit groups. The major group includes pure and applied science, engineering and related technology occupations. The following are some of the characteristics of these occupational groups:

- These are occupations that are defined by a knowledge specialization;
- Their boundaries are defined in terms of specific fields of science, applied science, engineering and technology;

- In addition to specialized knowledge, skill sets of a more cross-occupational nature such as contracting, research and product development, project management, and personnel management are often important elements.
- In the case of scientific occupations, the shared skill sets alone cannot be expected to result in lateral mobility due to the specialized scientific or technical knowledge that defines the occupation.
- Lateral mobility between occupations is most likely to occur with years of experience within an industry such as petroleum. In such cases lateral mobility is likely the result of an individual developing knowledge through experience outside the normal realm of his or her occupation. This type of mobility often occurs within a company. It will not be counted here as it is related to individual skill sets rather than occupational content.
- Engineering occupations and their related technologist and technician occupations are more disaggregated in the NOC than most other occupations. Since there is considerable mobility between engineering occupations, the relatively large number of unit groups may result in an inflated mobility rating for engineers. The ratings may have to be adjusted to account for this anomaly.
- Opportunities exist for occupational mobility to less technical areas such as management, technical sales, and management consulting.
- There are many good sources of information regarding most of these occupations including comprehensive JOBSCAN Skill Profiles and NGS mobility and dispersion data sets.
- Most occupations in this Major Group have related or parallel technical occupations that share a commonality of knowledge and to some degree, type of work.

### **3.2.3 Overview of Major Group 31- Professional Occupations in Health**

Major Group 31 is made up of five minor groups and 15 unit groups. The following are some of the general characteristics of these occupational groups.

- These occupations require very specialized knowledge of anatomy, medicine, pharmacology, dentistry and related medical procedures, treatments and therapies.
- They are highly regulated, with most requiring some kind of license or professional registration.
- Training is very specially focused to meet the requirements of a particular occupation. A large majority of graduates find work in their field of study.
- Lateral occupational mobility is very limited because of the highly specialized nature of the work and degree of regulation involved.

- In some occupations such as medical practitioners, the supply of qualified graduates is limited by agreement between the government and the professional associations.
- Because of the inflexibility of the market in this area, it is difficult to find data to support options for occupational mobility. As a result, the review of the qualitative information is all that is available, and it too, does not focus on mobility between occupations.
- Conclusions regarding possible occupational mobility are based on presumed knowledge and skill overlaps between professional medical occupations and between professional medical occupations and technical occupations.

### **3.2.4 Overview of Major Group 41- Professional Occupations in Social Science, Education, Government Service and Religion**

Major Group 41 is made up of six minor groups and 22 unit groups. The following are some of the general characteristics of these occupational groups.

- The occupations in this major group focus on legal and social issues as well as teaching, counselling, and spiritual guidance.
- There is some movement between occupations within minor groups such as between elementary and secondary school teachers, and between social workers and personal counsellors.
- Most occupations in this major group are not highly regulated with the exception of law professionals, teachers and psychologists.
- Professional associations play a major role in controlling access to these occupations.
- The study of psychology and sociology is important for many occupations in the group.
- There are considerable NGS data for the majority of occupations in this group. It is very helpful in verifying the qualitative information available.

### **3.2.5 Overview of Major Group 51- Professional Occupations in Art, Culture, Recreation and Sport**

Major Group 51 is made up of 3 minor groups and 14 unit groups. The following are some of the general characteristics of these occupational groups:

- The occupations in this major group focus on literary, artistic and creative pursuits;
- The educational requirements vary considerably from librarians requiring graduate work in librarianship, to artistic occupations with little or no formal requirement;

- Success in the artistic occupations depends almost entirely on talent and professional competence that can be attained through a number of venues;
- There is little or no regulation such as licensing to control entry to these occupations;
- Most occupations in the major group are highly specialized and mobility to other occupations in the major group is not likely. The exceptions are writing and related occupations;
- There is some mobility from artistic performing occupations to production, choreography, directing and composing;
- Teachers of creative and performing artists are included in the artists' unit group.

### **3.2.6 Overview of Major Group 12 - Skilled Administrative and Business Occupations**

Major Group 12 is made up of four minor groups and 23 unit groups. The following are some of the general characteristics of these occupational groups.

- Educational and experience requirements are often flexible. In most cases graduates with a generally appropriate level and type of education are acceptable. Appropriate skills and knowledge are characteristically obtained college programs, experience and training on the job;
- Many of the occupations have substantial overlaps of skills and knowledge. This is especially true of administrative occupations;
- There is little regulation controlling access to these occupations;
- There are a large number of jobs available in these occupations, which makes entry to them relatively easy for experienced workers from within this major group. Many workers advance from occupations in Major Group 14 Clerical Occupations;
- Most of these occupations are found across industrial sectors. Inter-industry mobility is common;
- Progression and occupational mobility is characterized by internal promotion. This major group contains 5 unit groups of supervisors. Direct entry to these occupations is unlikely. Supervisors are normally promoted to their positions from within an establishment. This pattern is also characteristic of regulatory and court occupations. As a result, these groups have been removed from this study.

### **3.2.7 Overview of Major Group 22 - Technical Occupations Related to Science and Applied Sciences**

Major Group 22 is made up of seven minor groups and 31 unit groups. The following are some of the general characteristics of these occupational groups.

- The occupations in this major group to a large degree mirror the occupations in Major Group 11 Professional Occupations in Natural and Applied Sciences. There are parallel scientific and engineering occupations such as Civil Engineering Technologists and Technicians, Applied Chemical Technologists and Technicians, and Forestry Technologists and Technicians.
- Training and education tends to be formal in nature and undertaken at the college and sometimes university level.
- There are differences between the technologist and technician levels. This should not interfere with our ability to use these groups in the model.
- Some graduates of professional programs enter the work force as technologists or technicians and progress from there to the professional level.
- Mobility to professional occupations is possible with some combination of experience and additional training.
- Mobility to management is common.
- The technical training is less theoretical and more focused on subject matter specific processes and procedures than that for professional scientific and applied science occupations. This may adversely affect lateral mobility.
- There are several occupations in this major group directly related to civil engineering technology.
- It is possible for technologists and technicians to move laterally into technical sales.

### **3.2.8 Overview of Major Group 32 - Technical and Skilled Occupations in Health**

Major Group 32 is made up of three minor groups and 18 unit groups. The following are some of the general characteristics of these occupational groups.

- Most occupations in this major group are highly specialized and centre on a particular process or technique. e.g. medical sonographers, dental therapists, medical laboratory technologists.
- Occupations in this major group tend to be licensed and regulated. Training can be undertaken at college, or in some cases, within hospitals.

- Because of the specialized nature of the training and work, there is little mobility between occupations in this Major Group.
- Mobility to professional occupations in Health would require re-training. There are no established routes of mobility between the skill levels.
- Several groups have been eliminated from the study because they are made up of a number of unrelated medical technical specializations. In such cases mobility between occupations in the groups is not possible. Examples include 3232, Midwives and Practitioners of Natural Healing, and 3219, Other Medical Technologists and Technicians (Except Dental Health).

### **3.2.9 Overview of Major Group 42 - Paraprofessional Occupations in Social Science, Education, Government Service and Religion**

Major Group 42 is made up of one minor group and seven unit groups. The following are some of the general characteristics of these occupational groups.

- This is a very small major group. Much of the work in this subject matter area is done at the professional level.
- Unit Group 4212 Community and Social Service Workers serves as an entry point for professional and paraprofessional work in the area of social work and counseling. For example, we find some nurses, probation officers and teachers as well as workers trained in social work and counseling in this occupation. Mobility to professional occupations is possible with experience and possibility additional education.
- Several unit groups have been eliminated from the study because of their heterogeneous nature. They include 4211, Paralegal and Related Occupations, 4216, Other Instructors, and 4217, Other Religious Occupations.

### **3.2.10 Overview of Major Group 52 - Technical and Skilled Occupations in Art, Culture, Recreation and Sport**

Major Group 52 is made up of five minor groups and 20 unit groups. The following are some of the general characteristics of these occupational groups.

- This major group is eclectic in nature. Some occupations support art, culture, recreation and sport directly by participation e.g. photographers, recreation programs leaders and coaches. Others provide appropriate technological support e.g. film and video camera operators and broadcast technicians.
- Entry to these occupations is unregulated. Training can be undertaken at college as well as on the job. There is considerable occupational mobility between support occupations in motion pictures, broadcasting and performing arts.

- Success is dependent on experience and achievement. Some artistic talent or skill is required for almost all occupations in this group.
- Most occupations in recreation and sport also depend on innate skill as well as training and education.

### **3.2.11 Overview of Major Group 62 - Skilled Sales and Service Occupations**

Major Group 62 is made up of seven minor groups and 19 unit groups. The following are some of the general characteristics of these occupational groups.

- This is a large major group with many well-defined traditional occupations, e.g. cooks, bakers, police officers, hairdressers, firefighters.
- Most occupations require specific training and experience, and sometimes apprenticeship.
- Entry to the sales and insurance occupations is governed more by general education, relevant experience and personal suitability.
- Mobility to supervisory occupations is normally from within establishments. Since direct outside hiring is unusual, the Minor Group 621 Sales and Service Supervisors has been removed from this study.
- There is little mobility between occupations in the major group. There may be some between business specializations e.g. retail and wholesale buyers may become technical sales specialists.

### **3.2.12 Overview of Major Group 72/73 - Trades and Skill Transport and Equipment Operators**

Major Group 72/73 is made up of 17 minor groups and 60 unit groups. The following are some of the general characteristics of these occupational groups.

- This major group is large and dominated by the traditional trade occupations such as plumbers, machinists, carpenters, painters and tile setters.
- Occupational competence is developed on the job, often through the formal apprenticeship system supplemented with college or industry courses.
- Some provincial and territorial apprenticeship programs are available for most occupations in this major group.
- Mandatory certification or licensing varies from province to province and from trade to trade. Some trades such as motor vehicle mechanics and plumbers must be certified in all or almost all provinces and territories.

- Mobility between provinces is facilitated by the Red Seal Program that allows workers who qualify, to have their credentials recognized in all participating provinces and territories.
- There is a fairly high degree of shared skills and knowledge between trades. Some skills such as blueprint reading and tool use are common across trades. Others such as measuring, cutting, fitting may not be identical but share common features.
- Despite commonalities, mobility between trades usually requires additional technical knowledge and training.
- Occupations that appear to have significant overlaps in skills and knowledge have been identified but mobility between these occupations has not been assumed. Examples include tile setters and cement finishers; construction electricians and industrial electricians; plumbers and pipe fitters.
- Tradespersons often become independent contractors.

### ***3.2.13 Overview of Major Group 82 - Skilled Occupations in Primary Industry***

Major Group 82 is made up of six minor groups and 15 unit groups. The following are some of the general characteristics of these occupational groups.

- The occupations in this major group are classified according to industry.
- Occupational competence is normally developed on the job, usually through company, industry and/or college training.
- Within industries, there is considerable occupational mobility. Most individuals progress to occupations in this major group from related occupations in Major Group 84, Intermediate Occupations in Primary Industry.
- There is some mobility between occupations in forestry and agriculture. For example, in some provinces it is not uncommon for logging and farming to be combined.
- Most occupations in this major group are part of an internal progression system of hiring and promotion. As a result, outside hiring at Skill Level B is unusual for most occupations.
- Most occupations in this major group were eliminated from the study because they were very heterogeneous and dominated by internal progressions.



### **3.2.14 Overview of Major Group 92 - Processing, Manufacturing, and Utilities Supervisors and Skilled Operators**

Major Group 92 is made up of three minor groups and 17 unit groups. The following are some of the general characteristics of these occupational groups.

- The occupations in this major group are classified according to industry.
- Hiring and promotion are normally within a company. Workers usually start with entry-level jobs at Skill Level C or D. They work their way up to more skilled jobs through internal competition. Jobs in this major group normally require considerable experience with the company.
- Training is industry specific and often company specific. Colleges provide some training.
- Opportunities for lateral occupational mobility between companies are very limited. All occupations in this major group were eliminated from the study because they were dominated by internal progressions. Direct outside hiring at this level would be unusual.

### **3.3 Final Observations**

- The results of this study must be treated with caution. As mentioned throughout the study, there are limitations in the information available and a host of technical problems mostly related to unit group composition that impact on the quality of the result.
- These results have not been validated with professional associations, industry or labour.
- In general, we have been cautious in making judgments. This means that some possible appropriate “destination” occupations may have not been included for some occupations.
- This caution has also resulted in a large number of occupations being eliminated from the study. The elimination of these groups will impact negatively the mobility opportunities of occupations remaining in the study. (For example, the removal of technical sales will mean that engineers, science and technology technologists and technicians, and medical professionals will have lost the opportunity for another ‘destination’ occupation). It is anticipated that these “lost opportunities” will be distributed relatively evenly across occupations.
- We have tried to apply the rules of decision consistently across all occupations. Therefore it will be possible to change assumptions, and test the results.
- The ratings are designed to reflect the opportunities of new entrants to the labor market at Skill Levels A and B. It is important to note that the rating for occupational mobility do not indicate career paths. For example, starting points below Skill Level B are not included; neither are progressions to management.
- The Appendix to this document contains Work Sheets used to determine the mobility for each unit group.