



| ICAO

Aviation Satellite Account

Recommended Methodological Framework

Draft

ICAO

16/09/2019

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Acknowledgements

In accordance with the growing need to measure the importance of aviation using credible and reliable methodology, the International Civil Aviation Organization (ICAO) established an Expert Advisory Group (EAG) under the Aviation Data and Analysis Panel (ADAP) to carry out the development of an Aviation Satellite Account (ASA) methodological framework in line with the internationally-agreed standard of the *System of National Accounts, 2008* (2008 SNA). The EAG was comprised of aviation data experts and national account specialists nominated by ICAO Member States, the United Nations Statistics Division (UNSD) and other international organizations; and the group has taken extensive advices provided by UNSD.

The ASA methodological framework aims to measure the direct contribution of aviation to national economy. It adopts the basic system of concepts, classifications, definitions, tables and aggregates of the 2008 SNA, and at the same time allows for the harmonization and reconciliation of aviation statistics from a national accounts perspective. The ASA methodological framework is intended for use by all countries, having been designed to accommodate the needs of countries at different stages of economic development.

Chapter 1. Introduction

A. Aviation

1.1 Aviation is a vital enabler of economic activity by providing defence services through military aviation and transport and related services through civil aviation. Civil aviation covers not only the commercial air transport of passengers and freight, but also include all related industries such as general aviation, airports, air navigation service providers and those activities directly serving passengers or providing air freight services. These aviation related industries form together the civil aviation industry, the focus of the handbook. Commercial air transport, for example, provides businesses and households with swift and accessible transport across the globe, while general aviation includes services such as the efficient application of chemicals for large scale agriculture or pleasure flying. Civil aviation generates wealth, employment and numerous socio-economic spin-offs through its own activities, supply chains and a wide spectrum of other economic activities, especially trade and tourism. For example, significant portions of tourism would not exist in the current form without the existence of aviation.

1.2 Civil aviation is dynamic and constantly developing. With currently more than 1,300 commercial airlines, 31,700 commercial aircraft in service, 3,700 airports and 170 air navigation services providers, civil aviation has established an unmatched air transport network to serve the needs of travellers and businesses in every corner of the world. A sound and economically viable civil aviation industry improves air connectivity between countries, creates more competitive business opportunities, and increases consumer benefits and choices. The increased connectivity subsequently feeds into aviation re-investment, creating a sustainable and healthy cycle of aviation and economic development.

The past, present and future of civil aviation

1.3 From a long-term historical perspective, global civil aviation activity has doubled in size every fifteen years in terms of air traffic volumes despite changing macroeconomic conditions and various external crises. Since 1960, technological progress and increasing demand for passenger and freight services has resulted in an increase in air traffic volumes by a factor of more than 30 compared to an increase in real global gross domestic product (GDP) of more than five times over the same period.

1.4 Civil aviation demonstrated long-term resilience and according to the latest long-term traffic forecasts of the International Civil Aviation Organization (ICAO), both scheduled air passenger traffic and air freight traffic are expected to more than double in the next two decades.

Civil aviation is a major contributor to global socio-economic development

1.5 Civil aviation bridges different destinations for leisure and business passengers and provides speedy deliveries of goods and services. It generates economic growth, creates jobs, and facilitates international trade and tourism. The level of economic activity of the civil aviation

industry in a country is closely linked to the level of economic activity in that country. It also acts as an economic catalyst for local, regional and national economies around the globe. Higher levels of economic activity go hand in hand with a growing demand for air transport, benefiting not only from expanding industries and trade but also from generally higher income and consumer spending.

1.6 Civil aviation is by far the world's safest and most efficient mode of long-range mass transportation. It is the only practical means of transportation to provide health care to many remote communities, and it is the fastest and most reliable way to deliver urgent humanitarian aid during emergencies caused by natural disasters, famine and war.

Civil aviation supports sustainable development goals

1.7 The United Nations (UN) adopted the *Transforming our World: 2030 Agenda for Sustainable Development* in 2015. According to this agenda, the world should aim to achieve 17 Sustainable Development Goals (SDGs) and 169 targets by 2030. The Strategic Objectives of ICAO are strongly linked to the 17 SDGs, and support the role of ICAO as the custodian agency responsible for collecting and sharing data for the global indicator (passenger and freight volumes by mode of transport) of the SDG target 9.1 – *Develop quality, reliable, sustainable and resilient infrastructure with a focus on affordable and equitable access for all*. Attainment of this SDG target relies on advances in sustainable air transport, which is a driver of sustainable development. The future growth of air transport holds tremendous economic potential, which will support all countries in achieving the United Nations 2030 Agenda for Sustainable Development.

B. Current measurement of civil aviation and the need for a robust form of economic measurement

1.8 Notwithstanding the benefits of civil aviation to socio-economic development, its importance to national economies appears not to be fully understood. This may mainly be due to a shortage of reliable economic information related to civil aviation. Current statistical measures of civil aviation have limited economic utility, and have mainly been based on physical parameters focusing on the operations of commercial air transport activities with the purpose of providing the traffic exposure data necessary to derive trend level indicators related to safety, efficiency and environmental protection required for managing the sustainable development of civil aviation activities.

1.9 The first steps toward compiling complete and reliable civil aviation statistics were made by the framers of the Convention on International Civil Aviation and the obligation to file statistical information with ICAO is set out in Article 67:

“Each contracting State undertakes that its international airlines shall, in accordance with requirements laid down by the Council, file with the Council traffic reports, cost statistics and financial statements showing, among other things, all receipts and the sources thereof”.

1.10 Under the ICAO Statistics Programme, the Organization has been collecting comprehensive statistics from its Member States related to commercial air transport, airports, air navigation services and en-route facilities.

1.11 These statistics include both the operational and financial performance of air carriers, airports and air navigation service providers. Examples of operational statistics include the number of flights, aircraft kilometres flown, number of passengers and volume of freight carried by airlines, and the origin and destination of the flight. Examples of financial statistics include the income and expenditure statements, balance sheets and statement of retained earnings. The statistics are collected on a recurring basis through a series of Air Transport Reporting Forms and are made available to Member States and the public.

1.12 Civil aviation statistics collected by the Organization represent the basic information on commercial air transport networks. ICAO, Member States and other organizations use these statistics as input for a range of analyses, such as planning for future air navigation requirements, aviation safety, training of civil aviation licensed personnel to meet future air traffic demand and modelling emissions from civil aviation activities.

1.13 In contrast to the rich statistics related to commercial air transport, there are very few sources of robust economic statistics for all aspects of civil aviation. Civil aviation encompasses a wide range of activities that either use aircraft to provide commercial air transport services or general aviation services, or produce goods or services that support the use of aircraft, including aircraft maintenance and repair, airport services and air navigation services. The industry also consumes supplies of other goods and services, such as aviation fuel, airline catering and all the supporting facilities and services.

1.14 The compilation of economic statistics for all components of civil aviation would provide regulators, policy makers and analysts with better data for evidence based policy decisions. For example:

- a. regulators would be able to analyze the cost impacts of changes to regulations on civil aviation participants;
- b. policy makers would be able to better understand the economic issues facing civil aviation and develop policy accordingly; and
- c. analysts would be able to study the economic links between the various parts of civil aviation and how they may respond to specific changes.

1.15 While some research and analysis has been conducted to estimate the economic activities of civil aviation such as its contribution to GDP and jobs, there has been no internationally-agreed methodological framework to measure these contributions. Consequently, the credibility, reliability, robustness and accuracy of such estimates are often questioned and challenged.

1.16 It is therefore necessary to develop an internationally-agreed methodology framework to measure the economic contribution of the civil aviation industry to the overall economy. A methodology of this kind will result in reliable data to highlight the importance and magnitude of civil aviation using the same concepts, definitions and measurement approaches as other industries.

C. The System of National Accounts and Satellite Accounts

1.17 The *System of National Accounts* (SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity in accordance with strict accounting conventions based on economic principles. It describes a coherent, consistent and integrated set of macroeconomic accounts in terms of a set of concepts, definitions, classifications and accounting rules for measuring such items as gross domestic product (GDP), the most frequently quoted indicator of economic performance. The latest version of the SNA was adopted by the United Nations Statistical Commission (UNSC) in 2008 and is available at: <https://unstats.un.org/unsd/nationalaccount/sna.asp>.

1.18 In addition, the SNA provides an overview of economic processes, recording how production is distributed among consumers, businesses, government and foreign nations. It shows how income originating in production, modified by taxes and transfers, flows to these groups and how they allocate these flows to consumption, saving and investment. Consequently, the national accounts provide the building blocks of macroeconomic statistics to facilitate economic analysis and policy formulation.

1.19 A great strength of the SNA is that its articulation is sufficiently robust that a great deal of flexibility can be applied in its implementation while still remaining integrated, economically complete and internally consistent. Recognizing that the measurement of specific domains may need more flexibility and insight within the framework of the national accounts, the SNA incorporates the concept of satellite accounts as an extensive form of flexibility that are intended for special purposes without altering the globally accepted framework of the SNA.

1.20 The 2008 SNA provides for two types of satellite accounts that can be used as an avenue to examine economic issues that the standard national accounts may not be able to address:

- a. One type involves some rearrangement of central classifications and the possible introduction of complementary elements. Such satellite accounts mostly cover accounts specific to given fields such as education, tourism and environmental protection expenditures and may be seen as an extension of the key accounts. The main reason for developing such a satellite account is that to encompass all the detail for all sectors of interest as part of the standard system would simply overburden it and possibly distract attention from the main features of the accounts as a whole. Many elements shown in a satellite account are invisible in the central accounts. Either they are explicitly estimated in the making of the central accounts, but they are merged for presentation in more

aggregated figures, or they are only implicit components of transactions which are estimated globally. They may involve some differences from the central system, such as an alternative treatment of ancillary activities, but they do not change the underlying concepts of the SNA in a fundamental way; and

- b. The second type of satellite analysis is mainly based on concepts that are alternatives to those of the SNA. These include a different production boundary, an enlarged concept of consumption or capital formation, an extension of the scope of assets, and so on. Often, a number of alternative concepts may be used at the same time. This second type of analysis may involve, like the first, changes in classifications, but in the second type, the main emphasis is on the alternative concepts. Using those alternative concepts may give rise to partial complementary aggregates, the purpose of which is to supplement the central system.

1.21 The first type of satellite accounts expands the scope of national accounts to cover a specific area of interest. Satellite accounts therefore add to the existing accounts and organize information in a consistent way so that the same can be used by policy makers for informed decisions. They enable a more comprehensive picture of a specific economic activity by bringing together components of that activity, including activities that are internal to the firm or to the household and for which there are no observable prices.

D. Aviation Satellite Account and its benefits

1.22 Since the 2008 SNA does not list civil aviation as an industry per se, there is a need of establishing a global standard to measure the economic activities of civil aviation in a manner that would make international comparison possible and feasible, while maintaining compliance with the SNA. The development of the *Aviation Satellite Account (ASA)* presents an excellent opportunity to measure civil aviation activities within the national accounting framework. It provides a complete summary of civil aviation, in addition to certain areas that standard national accounts do not have, for example:

- a. while some civil aviation goods and services are separately identified in the international standard for the classification of products (the Central Product Classification or CPC), the International Standard Industry Classification of All Economic Activities (ISIC) does not allow the identification of a civil aviation industry beyond air transport;
- b. while an economic entity may produce a range of outputs, both civil aviation and other outputs, the entity is classified only by the industry that reflects the highest contribution to the entity's total output. Thus, where aviation products represent only a secondary output, a satellite account would reclassify this activity to the civil aviation sector in addition to excluding non-aviation outputs from civil aviation entities;
- c. for analytical purposes, it may also be useful for countries to compile an ASA to produce estimates of the intermediate consumption of in-house produced civil aviation services (ancillary activity) undertaken by non-civil aviation entities; and
- d. while the SNA notionally includes all production within an economy, the production of services by households for their own consumption is very difficult to measure and is intentionally excluded from the scope of the SNA. For many countries, private flying

represents a significant proportion of total civil aviation activity and is an area of significant interest for aviation analysts.

1.23 Building on the SNA framework, the ASA will allow policy makers to assess the total monetary value from the civil aviation segment of the national accounts by adding together the values from each defined component of civil aviation activity and thus deriving a single measure of the value of the entire civil aviation industry. This data can then be used by itself or combined with other data to analyze changes in aviation services themselves and their relationships to other industries. This, in turn, will give policy makers the appropriate wherewithal to gauge policy impacts on the industries that are the biggest consumers of aviation output as well as the industries that provide inputs consumed by aviation.

1.24 With the compilation of ASA, policymakers will have a globally accepted common measurement of the civil aviation industry within their area of study, in terms of value added, and relative contribution to GDP and employment. These data will help policymakers, investors, and lenders to estimate return on investment of government budgets, taxpayer funding or private investment in the aviation sectors. Some nations may have a higher dependence on aviation services for the growth of other industrial activities, such as business, trade and tourism. With better data on the civil aviation industry, investors will have better information on which to base their decision making related to financing the civil aviation industry and related infrastructure.

1.25 The quantification of the overall employment attributable to the civil aviation industry will justify the need for investment in human capital in the form of public and private education, including institutions of higher learning, technical colleges, and vocational training for the local population.

1.26 In addition, the ASA provides an international standard for producing, presenting and analyzing civil aviation economics data. The ASA also integrate the existing civil aviation statistics as well as the economic information necessary for informed policy development and governmental decision making.

E. The Aviation Satellite Account methodological framework

1.27 The ASA is consistent with the first type of SNA satellite accounts as explained in paragraph 1.21a. The ASA methodological framework therefore, follows the traditional SNA framework and keeps intact the existing linkages to the national accounts. The methodological framework expands the SNA classifications to highlight and separately identify civil aviation in the existing national accounts data and also incorporates additional elements, both monetary and non-monetary, to further assist informed policy making. The ASA emphasizes what is already embedded in the SNA and dedicates resources to improving the corresponding measurement of civil aviation activities, including the separate identification of in-house aviation and aviation services for own final use.

1.28 From this perspective, the ASA presents in detail the supply of civil aviation goods and services produced in a country or being imported and how this supply is being used as intermediate or final consumption.

1.29 Compiling the supply and use of civil aviation products allows for calculating the direct gross value added (GVA) and GDP of the civil aviation industry. Additional data are prepared to cover both monetary and non-monetary data.

1.30 The tables that make up the ASA provide comprehensive, relevant economic information related to the size of the civil aviation industry in the economy concerned, inter alia:

- a. macroeconomic aggregates that describe the size and the direct economic contribution of civil aviation, such as civil aviation direct GVA and civil aviation direct GDP, consistent with similar aggregates for the total economy and for other economic activities and functional areas of interest;
- b. detailed civil aviation consumption of products supplied by other industries as intermediate input to provide civil aviation products;
- c. imports and exports, compensation to employees, taxes raised by aviation and subsidies received by aviation;
- d. gross capital formation, including fixed assets such as aircraft and airport facilities; and
- e. non-monetary information on aviation, such as the number of jobs created by aviation, air traffic generated, and the number of aviation users.

1.31 Although some implicit assumptions are needed for the compilation of the recommended tables, the ASA is mainly descriptive in nature and does not include any measurement of the indirect and induced effects of aviation consumption on the economy as a whole. This means that total economic impact of aviation on the economy would not be fully reflected in the ASA tables and must therefore be measured and analyzed using other means. This can be done, for instance, using input-output analysis, a social accounting matrix or computable general equilibrium models based on the ASA or other modeling instruments which allow for comprehensive aviation impact analysis. It is important to note that ASA is an accounting framework based on observed data and not the modeling of certain economic activities based on simulated data.

1.32 The ASA methodological framework should be considered from two different perspectives:

- a. as an economic statistical tool that complements these definitions, aggregates and classifications and articulates them into analytical tables which provide elements for comparing direct economic contribution from civil aviation between regions, countries or groups of countries. These elements are also comparable with other internationally recognized macroeconomic aggregates; and
- b. as a framework that provides guidance to countries in the further development of their civil aviation economic statistics, the main objective being the completion of the ASA.

1.33 The design of the ASA methodological framework focuses on reclassifications within the production boundary of the 2008 SNA in order to come up with aggregates for civil aviation that are directly comparable with other aggregates compiled according to the 2008 SNA.

1.34 The Aviation Satellite Account methodological framework 2019 is the first guidance of its kind and should be taken as the starting point of a process of methodological development and improvement of the system of civil aviation economic statistics, including basic data collection. Its implementation by countries may depend on the development achieved in the corresponding implementation of the 2008 SNA.

F. Structure of the document

1.35 The handbook provides guidance on how a satellite account may be compiled for the measurement of civil aviation activities in a country according to the principles of the 2008 SNA.

1.36 Chapter 1 describes civil aviation and how it supports global socio-economic development, and further explains the need for the ASA to measure the economic contribution of civil aviation using an internationally-agreed methodological framework.

1.37 Chapter 2 presents the classification of civil aviation industries that is based on the ICAO Classification of Civil Aviation Activities, and its correspondence with the *International Standard Industry Classification* (ISIC). While this classification should have universal relevance across countries, countries may wish to include additional detail to meet their specific data needs.

1.38 Chapter 3 provides a summary of civil aviation products. Many products are separately identified in the *Central Product Classification* (CPC), but scattered across the classification. This chapter draws them together as civil aviation products, with the addition of a number of other civil aviation products that are not separately identified in the CPC.

1.39 Chapter 4 examines the relationship between the sequence of national accounts and supply and use tables, and presents the supply-use framework for the ASA.

1.40 Chapter 5 discusses the production of aviation services by producers and households for their own use. The own-use production of aviation services by non-aviation industries represents intermediate consumption and is within the scope of the SNA. However, the own final use of civil aviation products by households represents final consumption and is outside the scope of the SNA production boundary.

1.41 Chapter 6 summarizes a series of tables describing the monetary and non-monetary information such as GDP, GVA and employment of each component of the civil aviation activity. With civil aviation being a relatively capital-intensive segment of the economy, the compilation of capital formation for civil aviation would be a valuable addition to standard activity-based satellite accounts. This chapter provides guidance on how monetary and non-monetary data and capital formation may be compiled for civil aviation.

1.42 Chapter 7 provides the capacity building and future outreach activities, and the support that ICAO can provide to States for the development of the ASA.

1.43 Finally, this document includes Appendices, which provide detailed descriptions, classification of civil aviation activities and products for the measurement in the ASA, the supply and use tables, and other monetary and non-monetary data.

Chapter 2. Define Relevant Industries

2.1 Various satellite accounts were developed by providing more detailed production accounts for a particular field of interest. A typical example is the Transport Satellite Account (TrSA) which was successfully developed and implemented by countries such as Australia, Canada, France and the United States. Transport satellite accounts highlight the contribution of transport to the economy by the various types of transport industries as well as those transport related activities carried out as secondary activities in other industries in the economy. These secondary activities would otherwise be invisible because they are combined with the primary activities of establishments of various industries. The Aviation Satellite Account methodological framework follows a similar approach for measuring the civil aviation industry. The civil aviation industry covers not only the air transport of passengers and freight, but also include all related industries such as general aviation, airports, air navigation service providers and those activities directly supporting the operation of aircraft.

2.2 The ASA provides a comprehensive measure of the economic contribution of the civil aviation industry in the economy. One of the first issues to be addressed for the compilation of the ASA is to identify the relevant civil aviation industries in the country.

2.3 The objective of this chapter is to provide recommendations for the classification of productive activities required for the ASA that is be both internationally comparable and nationally relevant. Existing classification and definition of civil aviation activities adopted in the ICAO Statistics Programme is commonly used globally in the civil aviation statistics. Based on this, the scope of the measurement of the civil aviation industry in the ASA will follow the definition of civil aviation activities adopted in the ICAO Statistics Programme.

2.4 In order to allow international comparability by economic activity in a standardized way, this methodological framework further presents the mapping of civil aviation activities with the *International Standard Industrial Classification of All Economic Activities* (ISIC, Rev. 4).

A. Definition of civil aviation activities under the ICAO Statistics Programme

A1. ICAO Statistics Programme

2.5 ICAO's Statistics Programme provides an independent and global foundation to foster the planning and sustainable development of international air transport. Each Member State has undertaken that its international airlines shall file the statistics requested by the Council in accordance with Article 67 of the Convention. The following are some of the key civil aviation statistics indicators being collected through various ICAO Statistical Air Transport Reporting Forms:

- a. Commercial air carrier traffic and capacity, e.g. number of flights, aircraft kilometres flown, number of available seats and tonnes offered, number of passengers, freight or mail carried, traffic by flight stage;
- b. Commercial air carrier financial statistics, e.g. operating revenues and costs, profit and loss, and balance sheet;
- c. Commercial air carrier fleet and personnel, e.g. number, capacity and utilization of aircraft by type; number and expenditure for personnel by category;
- d. Airport traffic, e.g. aircraft movements, number of passengers embarked and disembarked, and freight loaded and unloaded;
- e. Airport revenues, e.g. aeronautical revenues associated with aircraft and air traffic operations, and non-aeronautical revenues received through other activities not directly linked to aircraft or air traffic operations;
- f. En-route facility statistics, e.g. number of flights moving through the corresponding flight information region (FIR)/upper information region (UIR), and revenues, expenses, investments and number of staff employed; and
- g. Civil aviation statistics, e.g. number of civil aircraft registered by a State, number of personnel licensed, and number of aviation training institutions.

2.6 The details of the ICAO Statistical Air Transport Reporting Forms and instructions are available at: <https://www.icao.int/sustainability/Pages/eap-statistics-programme.aspx>. ICAO also provides adequate guidance and standards to those officials of governments, airlines, airports air navigation suppliers who are engaged in the preparation of statistical data to be reported to the Organization. The fifth edition of the Reference Manual on the ICAO Statistics Programme (Doc 9060/5) was published in 2010 and is available to all Member States

2.7 In order to effectively meet the needs of the Organization and its Member States, ICAO has been continuously working to improve the uniformity of the statistics, and the form and content of analyses, in addition to providing assistance to States for the improvement of their civil aviation statistics and statistical reporting.

A2. Definition of civil aviation activities in the ICAO Statistics Programme

2.8 Over the years, ICAO has developed a system of definitions to support the process of preparing and updating the various Annexes to the Chicago Convention and related documents such as manuals and circulars. Definitions of civil aviation activities were also developed to respond to the statistical needs under the framework of ICAO's Statistics Programme.

2.9 The various uses of civil aviation data, such as analyses related to safety, security and the efficiency of civil aviation and its environment impact, as well as forecasting and planning, require a suitable classification and a clear definition of civil aviation activities—in particular, those covered directly or indirectly, by ICAO Standards and Recommended Practices (SARPs).

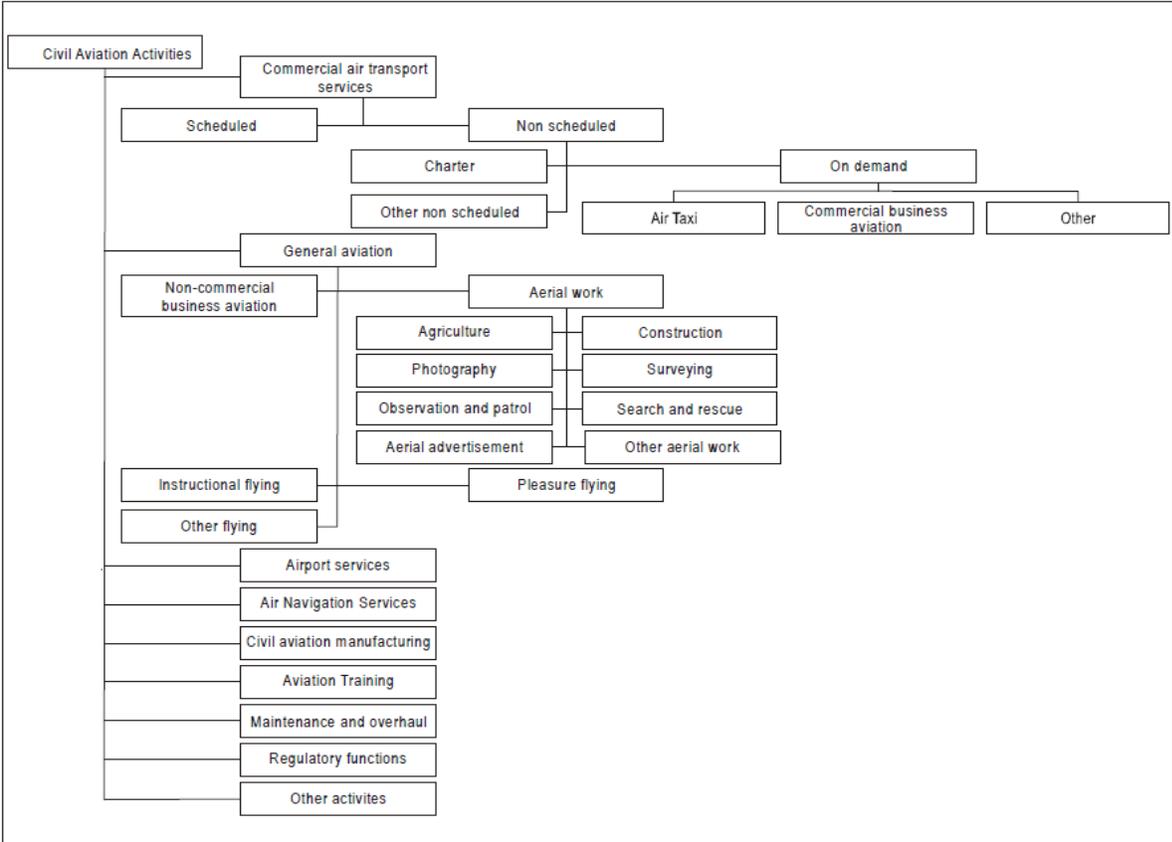
2.10 In order to establish what statistical data ought to be collected, one needs to establish the uses one wishes to make of the data and the expected analytical processes one wishes to carry out based on those data. Hence, while in some cases parameters have a similar name,

the purpose for which they are collected will determine the corresponding definitions. For example, the statistical parameters for commercial air carriers which ICAO requests States to collect were established with very specific intentions in mind; all the data requested must correspond to those of the operating air carrier. The purpose of this is so that all data reported for the same entity are homogeneous and can be used to carry out cross-analytical processes comparing, for example, traffic and capacity data, and these with the corresponding revenues and cost figures. Also, it ensures homogeneity of data between the reports for different air carriers, thus allowing benchmarking analysis to be carried out.

2.11 In addition, any data collection requires a clear definition of its related aviation activity. For instance, passenger and freight data are critical to analyze commercial aviation growth, while data on aircraft movement numbers are important for all aviation activities. In that context, a standard classification gathering a detailed definition list for every civil aviation activity is necessary to ensure a reliable data collection programme.

2.12 Consequently, on the basis of Recommendation 13 of the Tenth Session of the Statistics Division (STA/10)1, in 2010, the ICAO Council adopted the classification for civil aviation activities grouped into commercial air transport services, general aviation, airport services, air navigation services, civil aviation manufacturing, aviation training, maintenance and overhaul, as well as regulatory functions and other activities as shown in Figure 2.1.

Figure 2.1. Classification of civil aviation activities in the ICAO Statistics Programme



B. Definition of civil aviation activities and industries in the Aviation Satellite Account

2.13 Setting up an ASA requires the definition of the scope of measurement and the production boundary, i.e. which industries and activities make up the civil aviation industry. In satellite accounts, an industry is defined as the set of all production units engaged primarily in the same or similar types of productive activities. Production can be described in general terms as an activity in which an enterprise uses inputs to produce outputs. It is necessary to examine the characteristics of the outputs in order to be able to delineate activities that are productive in an economic sense from other activities.

2.14 An establishment is an enterprise (or part of an enterprise) that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added (see 2008 SNA, para. 5.14). Establishments are classified according to their main economic activity, which is determined by the activity that generates the most value added.

2.15 The grouping of all establishments with the same principal activity which produces civil aviation services directly constitutes one of the civil aviation characteristic activities. Civil aviation characteristic activities are the activities that typically produce civil aviation characteristic products. Thus, each civil aviation industry is composed of all establishments whose main activity is a particular civil aviation characteristic activity that serves aviation users directly.

2.16 Classification of an establishment is based on its main activity. Therefore, establishments having a particular aviation characteristic activity as a secondary activity should not be included in the civil aviation industry that is characterized by this activity. By the same token, many establishments belonging to civil aviation industries have secondary activities that are not civil aviation characteristic or have other civil aviation characteristic secondary activities.

2.17 As a consequence, the output of civil aviation industries might not consist exclusively of civil aviation characteristic products, and the output of other non-aviation industries may include some aviation characteristic products. The main output of civil aviation industries is, by definition, aviation characteristic products, but they may also produce other products. The main output of other industries is anything other than aviation characteristic products. The total output of any product is the sum of the output of this product from all the industries in the economy.

2.18 The classification and definition of civil aviation activities adopted under the ICAO Statistics Programme is internationally agreed and widely used for statistical and analytical purposes. It provides the basic terms used in civil aviation statistics and forms the basis for the classification of civil aviation characteristic activities and civil aviation industries for the scope of ASA measurement. Following this definition, economic activities that are directly attributable to civil aviation are grouped by major contributors, which – for the purpose of the ASA – constitute civil aviation industries. They include:

- a. Commercial air transport services, i.e. scheduled and non-scheduled passenger and freight air transport;
- b. General aviation, i.e. aerial work, instructional flying, pleasure flying and other flying;
- c. Airport services, i.e. aeronautical services and non-aeronautical services;
- d. Air navigation services;
- e. Maintenance and overhaul;
- f. Regulatory functions;
- g. Aviation training; and
- h. Other activities.

2.19 Civil aviation manufacturing includes the design, development, manufacture and in-service support of civil aviation products and technologies, including related ground-based systems. For the ASA, civil aviation manufacturing is excluded from the classification of civil aviation industry, however, the acquisition of aircraft is recorded as capital formation of the civil aviation industry.

C. International standard classification of economic activities

2.20 The *International Standard Industrial Classification of All Economic Activities* (ISIC) is the international reference classification of productive activities. Its main purpose is to provide a set of activity categories that can be utilized for the collection and reporting of statistics according to such activities. The ISIC, however, does not allow the identification of a separate civil aviation industry. In part, this is due to the way the ISIC classification has been structured.

2.21 ISIC is a classification according to kind of productive activity, and not a classification of goods and services. The activity carried out by a unit is the type of production in which it engages. This is the characteristic of the unit according to which it will be grouped with other units to form industries. This classification is presented in a four-level hierarchy, with categories mutually exclusive at each level of the hierarchy. The hierarchy is presented in a “top-down” format where categories at one level are disaggregated into sub-categories at a lower level with consistent definitions. The categories at the highest level are called sections, which are alphabetically coded categories intended to facilitate economic analysis. The classification is then organized into successively more detailed categories, which are numerically coded: two-digit divisions; three-digit groups; and, at the greatest level of detail, four-digit classes. The ISIC is organized in four levels; the use of letters for the section level of the classification is complemented by the use of a purely numerical system at the division (2-digit), group (3-digit) and class (4-digit) levels.

2.22 The priority upon which various characteristics are considered at each level of the hierarchy has a significant impact on the way activities are classified. At the highest level, characteristics of outputs and how outputs are used take precedence, while “at the most detailed level of the classification, preference has been given to the process and technology of production to define individual ISIC classes, particularly the classes related to services”.

2.23 The civil aviation industries are not separately identified in the ISIC. In fact only passenger air transport and freight air transport are specifically identified at the group level and even then, more than one civil aviation activity is covered.. ISIC classifies air transport first to *Section H Transportation and storage*, then *Division 51 air transport* before splitting passenger air transport (group 511) and freight air transport (group 512) with no further break down at the class level (see Figure 2.2). All other civil aviation activities are combined with other non-civil aviation industries. For example, aerial photography is classified in *Section M Professional, scientific and technical activities* under *Class 7420 Photographic activities*, which in addition to aerial photography, also includes portrait photography for passports, schools, weddings, etc., one-hour photo shops, and various other photographic activities (see Figure 2.3).

Figure 2.2. ISIC treatment of air transport

Section H Transport and Storage

Division	Group	Class	Description
Division 51			Air transport
	511	5110	Passenger air transport
	512	5120	Freight air transport

Figure 2.3. ISIC treatment of aerial photography

Section M Professional, scientific and technical activities

Division	Group	Class	Description
Division 74			Other professional, scientific and technical activities
	741	7410	Specialized design activities
	742	7420	Photographic activities This class includes: <ul style="list-style-type: none"> • Commercial and consumer photograph production, including aerial photography • Film processing • Activities of photojournalists

D. Mapping civil aviation activities and ISIC

2.24 In order to allow international comparability by economic activity in a standardized way the relevant ISIC Rev.4 categories are mapped with the list of defined civil aviation characteristic activities. It should be noted that many of the ISIC classifications are listed more than once, which implies that not all of the units in that specific classification represent a specific civil aviation category. .

2.25 The definition of the civil aviation industries and their mapping to ISIC is presented below. The complete list of internationally comparable civil aviation activities (civil aviation industries) and grouping by main categories according to ISIC Rev. 4 and detailed explanatory notes are included in Appendix 1.

D1. Commercial air transport services

2.26 **Commercial air transport** covers all air transport services available to the general public for the transportation of passengers, mail and or freight for remuneration. Commercial air transport services are classified into scheduled air transport and non-scheduled air transport.

2.27 **Scheduled air transport** is a commercial air transport service performed according to a published timetable, or so regular or frequent as to constitute a recognizably systematic series, which is open to direct booking by members of the public; and extra section flights occasioned by overflow traffic from scheduled flights. Scheduled commercial air transport services can be disaggregated further into international scheduled air transport and domestic scheduled air transport. In the national accounts, the export and import of air transport services is based on the usual residence status of the consumer of the service. Thus, the air transport services provided to a foreign tourist by a domestic airline would be considered an export of air transport services by the domestic economy; and the air transport services provided to a resident by an international airline would be considered an import of air transport services.

2.28 **Non-scheduled air transport** is a commercial air transport service other than those classified as a scheduled air transport. Non-scheduled air transport services are classified into charter, on-demand and other non-scheduled.

2.29 **Charter air transport** is a non-scheduled service using aircraft where the whole capacity of an aircraft is blocked off for commercial air transport operations.

2.30 **On-demand air transport** is a non-scheduled commercial air transport service on short notice usually performed with smaller aircraft. On-demand services are classified into air-taxi, commercial business aviation and other on-demand.

2.31 **Air-taxi** is an on-demand commercial air transport service for short range operation usually performed with smaller aircraft.

2.32 **Commercial business aviation** includes all commercial air transport services that are used by companies as an aid to the conduct of their business but excludes in-house production of business aviation services for intermediate consumption by the producing organization.

2.33 **Other on-demand air transport** includes all on-demand commercial air transport services that are not classified as air-taxi or commercial business aviation.

2.34 **Other non-scheduled air transport** includes commercial air transport services performed for remuneration on an irregular basis and are not classified as charter services or on-demand.

2.35 Classification of commercial air transport services with the corresponding ISIC classification is presented in Figure 2.4 as below. It should be noted that in certain cases the ISIC codes only partially covers the civil aviation activities.

Figure 2.4. Commercial air transport and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
1. Commercial air transport services		
1.1. Scheduled		
Passenger air transport	5110	Passenger air transport
Freight air transport	5120	Freight air transport
Postal activities	5310	Postal activities
Courier activities	5320	Courier activities
1.2. Non scheduled		
1.2.1. Charter		
Passenger air transport	5110	Passenger air transport
Freight air transport	5120	Freight air transport
Postal activities	5310	Postal activities
Courier activities	5320	Courier activities
1.2.2. On-demand		
Air taxi		
Commercial business aviation		
Other on demand services	8690	Other human health activities (air ambulance)
1.2.3. Other non-scheduled		

D2. General aviation

2.36 **General aviation** refers to all civil aviation operations other than scheduled and non-scheduled commercial air transport operations. General aviation activities are classified into instructional flying, pleasure flying, aerial work and other flying.

2.37 In terms of the national satellite accounts, **non-commercial business aviation** represents the in-house production of passenger or freight transport services for intermediate consumption of the operating unit. It involves the transport of employees or freight of the operating organization with no hire or reward arrangement in place to meet the transport needs of officials of a business.

2.38 **Aerial work** is an aircraft operation used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc. Aerial work operates mainly on a hire-and-reward basis, however sometimes aerial work is conducted by non-aviation organizations in-house for their own intermediate consumption and occasionally as secondary production for similar organizations.

- a. Aerial agriculture includes the use of aircraft to spread chemicals, seeds and fertilizers and the use of aircraft for the movement of livestock.;
- b. Aerial photography involves the use of aircraft for moving or still photography. With the recent rapid growth in the use of unmanned aircraft, it is not uncommon for the provision of aerial photography services to represent in-house production, particularly by the real estate industry;
- c. Aerial observation and patrol includes the use of aircraft for surveillance. Some part of aerial observation and patrol is also undertaken in-house by general government;
- d. Aerial advertisement includes skywriting and banner towing.
- e. Aerial construction involves the use of aircraft for construction purposes, including the carriage of sling loads. Countries may wish to include additional detail in their ASAs by measuring sling loads separately from the rest of aerial construction;
- f. Aerial surveying involves the use of aircraft for the inspection of pipelines or powerlines, quantity surveying, mapping, geophysical and other sensing activities. With the recent rapid growth in the use of unmanned aircraft, some aerial surveying is undertaken in-house;
- g. Aerial search and rescue includes all aviation search missions, as well as evacuation or rescue work. It is likely that some part of aerial search and rescue is undertaken in-house by general government;
- h. Other aerial work includes a number of aviation activities that could be recorded separately in ASAs, including aerial policing and aerial firefighting.

2.39 **Instructional flying** is defined as the use of an aircraft for purposes of formal flight instruction with an instructor. It includes flying schools and aero clubs where the majority of instruction takes place in an aircraft.

2.40 **Pleasure flying** is defined as the use of an aircraft for personal or recreational purposes not associated with a business or profession.

2.41 **Other flying** includes all general aviation flights that cannot be classified under non-commercial business aviation, aerial work, instructional flying or pleasure flying.

2.42 Classification of general aviation activities with the corresponding ISIC classification is presented in Figure 2.5 as below.

Figure 2.5. General aviation activities and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
2. General aviation		
2.1. Aerial work		
2.1.1. Agriculture	0161	Support activities for crop production
	0162	Support activities for animal production
2.1.2. Photography	7420	Photographic activities
2.1.3. Observation and patrol	8423	Public order and safety activities
2.1.4. Aerial advertisement	7310	Advertising
2.1.5. Construction	4390	Other specialized construction

		activities
2.1.6. Surveying	7110	Architectural and engineering activities and related technical consultancy
2.1.7. Search and rescue	8423	Public order and safety activities
2.1.8. Other aerial work		
2.2. Instructional flying	8549	Other education n.e.c
2.3. Pleasure flying		
	5110	Passenger air transport
	9319	Other sports activities
2.4. Other flying		
	5120	Freight air transport
	7120	Technical testing and analysis
	7210	Research and experimental development in natural sciences and engineering

D3. Airport services

2.43 **Airport services** are aeronautical and non-aeronautical services delivered by the airport operator. Aeronautical services are services delivered by the airport operator on account of aircraft operations while non-aeronautical services are not on account of aircraft operations.

2.44 **Airport aeronautical services** include the supply of aerodrome services to aircraft operators and ground handling services such as ground administration and supervision, passenger handling, baggage handling, freight and mail handling, ramp handling, aircraft services, fuel and oil handling, aircraft maintenance (light maintenance), flight operations and crew administration, surface transportation and catering services.

2.45 **Airport non-aeronautical services** include the concession services such as airport space, land equipment or facility rentals, car parking – airport owned and utility recharges; the leasing of airside real estate for aircraft repair, maintenance and storage, the leasing of terminal space to airlines, retail outlets and food service outlets.

2.46 Classification of airport services with the corresponding ISIC classification is presented in Figure 2.6 as below.

Figure 2.6. Airport services and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
3. Airport services		
3.1. Aeronautical services	4922	Other passenger land transport
	5223	Service activities incidental to air transportation
	5224	Cargo handling
3.1. Non-aeronautical services	6810	Real estate activities with owned or leased property

D4. Air navigation services

2.47 Air navigation services includes approach and aerodrome control services, en-route services such as air traffic management (ATM), communications, navigation and surveillance systems (CNS), meteorological services for air navigation (MET), search and rescue (SAR) and aeronautical information services (AIS). These services are provided to air traffic during all phases of aircraft operations, i.e. approach, aerodrome and en-route phase.

2.48 Classification of air navigation services with the corresponding ISIC classification is presented in Figure 2.7 as below.

Figure 2.7. Air navigation services and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
4. Air navigation services		
	5223	Service activities incidental to air transportation
	5229	Other transportation support activities

D5. Maintenance and overhaul

2.49 **Maintenance.** The performance of tasks required to ensure the continuing airworthiness of an aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

2.50 **Repair.** The restoration of an aeronautical product to an airworthy condition as defined by the appropriate airworthiness requirements. The restoration of an aeronautical product to an airworthy condition to ensure that the aircraft continues to comply with the design aspects of the appropriate airworthiness requirements used for the issuance of the type certificate for the respective aircraft type, after it has been damaged or subjected to wear .

2.51 Classification of maintenance and overhaul activities with the corresponding ISIC classification is presented in Figure 2.8 as below.

Figure 2.8. Maintenance and overhaul activities and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
5. Maintenance and overhaul		
	3313	Repair of electronic and optical equipment
	3315	Repair of transport equipment, except motor vehicles

D6. Regulatory functions

2.52 **Regulatory functions** are activities carried out by governmental agencies and public corporations, for example, the regulation of aviation safety standards, the negotiation of international air service agreements, the investigation of aviation safety incidents and the compilation of aviation statistics.

2.53 Classification of aviation regulatory functions with the corresponding ISIC classification is presented in Figure 2.9 as below.

Figure 2.9. Aviation regulatory functions and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
6. Regulatory functions		
	5229	Other transportation support activities
	7120	Technical testing and analysis
	8413	Regulation of and contribution to more efficient operation of businesses

D7. Aviation training

2.54 **Aviation training** is defined as flight crew training and operating under the supervision of government authority or other licensed flight training entities. Classification of aviation training activities with the corresponding ISIC classification is presented in Figure 2.10 as below.

Figure 2.10. Aviation training activities and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
7. Aviation training		
	8522	Technical and vocational secondary education
	8530	Higher education
	8549	Other education n.e.c.

D8. Other activities

2.55 Classification of other aviation activities with the corresponding ISIC classification is presented in Figure 2.11 as below.

Figure 2.11. Other aviation activities and mapping with classification in ISIC Rev.4

Civil aviation activities	ISIC Rev. 4	Description
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8. Other activities

5210	Warehousing and storage
5229	Other transportation support activities
7730	Renting and leasing of other machinery, equipment and tangible goods
8110	Combined facilities support activities
8121	General cleaning of buildings
8129	Other building and industrial cleaning activities
8130	Landscape care and maintenance service activities

E. Civil aviation associated industries

2.56 Civil aviation industries consume an uninterrupted supply of a wide range of products (goods and services) from other industries, for example, refined petroleum products (e.g. kerosene, oil, jet fuel for use in aircraft), food and beverage (e.g. airline catering), financial services (e.g. aircraft leasing) and all of the supporting facilities and services. In addition, civil aviation industries rely on the use of capital formation such as the aircraft produced by aircraft manufacturers and the airport constructions. The production activities for these goods and services are supplied by industries associated with civil aviation.

Chapter 3. Define Relevant Products

3.1 Based on the definition and classification of civil aviation industries, the next step is to define the products (goods and services) that are supplied by the civil aviation industries, and the ones that are used by the industries for providing their outputs. The objective of this chapter is to provide classification of products for Aviation Satellite Account that would be both internationally comparable and nationally relevant. The classifications refer to products, mainly those supplied by civil aviation industries.

3.2 In accordance with the 2008 SNA Chapter 29, the identification of industry-related products comprises two subcategories, characteristic products and connected products, that should be based on the significance of their link to the industries either worldwide or in the economy of reference.

3.3 Characteristic products are those typical of the field and supplied by the characteristic activities of defined industries. Connected products include the ones whose uses are interesting because they are clearly covered by the concept of expenditure in a given field, without being typical, either by nature or because they are classified in broader categories of products.

3.4 In order to provide recommendations for the classification of products required for measurement and analysis in the ASA that would be both internationally comparable and nationally relevant, the identification of civil aviation products using internationally approved classifications of products, the *Central Product Classification* (CPC, Ver.2) is presented in this chapter.

3.5 The CPC constitutes a complete product classification covering goods and services. It serves as an international standard for assembling and tabulating all kinds of data requiring product detail, including statistics on industrial production, domestic and foreign commodity trade, international trade in services, balance of payments, consumption and price statistics and other data used within the national accounts. It provides a framework for international comparison and promotes harmonization of various types of statistics related to goods and services.

A. Classifications of aviation characteristic products

3.6 Civil aviation characteristic products are those that satisfy the following criterion: the product should represent a significant share of the supply of the product in the economy (share-of-supply condition). This criterion implies that the supply of a civil aviation characteristic product would cease to exist in meaningful quantity in the absence of civil aviation users.

3.7 As the industrial origin of a product (the ISIC industry that produces it) is not a criterion for the aggregation of products within a similar CPC category, there is no strict one-to-one relationship between products and the industries producing them as their principal outputs. Two

products of similar characteristics, but produced by two different ISIC industries, would be classified in the same CPC category.

3.8 In the case of civil aviation industries, characteristic products are those supplied by commercial air transport services, general aviation services, airport services, air navigation services, maintenance and overhaul services, regulatory functions and aviation training services. Figure 3.1 presents the typology of aviation characteristic products and activities, each of them grouped in the corresponding civil aviation industries as defined in Chapter 2.

Figure 3.1. List of categories of civil aviation characteristic products and civil aviation characteristic activities (civil aviation industries)

Industries	Products
1. Commercial air transport	Scheduled passenger transport
	Scheduled freight and mail transport
	Charter passenger transport
	Charter freight and mail transport
	On demand air transport
	On demand commercial business aviation
2. General aviation	Aerial work, e.g. aerial spreading and spraying, aerial photography, aerial advertisement, etc.
	Instructional flying
	Pleasure flying
	Other flying
3. Airport services	Aircraft related service
	Passenger related service
	Cargo handling service
	Property and real estate, e.g. terminal rental to airlines
	Car parking - airport owned
	Utility recharges
4. Air navigation services	Airport concessions (e.g. retail, duty-free shops)
	En-route services
	Approach and aerodrome control services
	Air traffic management
	Communications, navigation and surveillance
5. Maintenance and overhaul	Aeronautical information services
	Aircraft maintenance
6. Regulatory functions	Aircraft repair
	Certification of aircraft
7. Aviation training	Aviation licensing, administrative services
	Pilot training
	Aviation professional training

3.9 The identification of internationally comparable civil aviation characteristic products grouped by main categories according to CPC Ver. 2 is presented in Figure 3.2. The full list with explanatory notes is included in Appendix 2.

3.10 For aviation characteristic products, the ASA should show how they are produced and what kinds of producers are involved, describe the production process and the inputs of capital, intermediate consumption and labour that are required, and compare the production and civil aviation use of these products over time and among countries.

Figure 3.2. Internationally comparable civil aviation characteristic products grouped by main categories according to CPC Ver. 2

1. Commercial air transport services
5110 - Passenger air transport
64134 – Sightseeing services by air
64241 – Domestic scheduled air transport services of passengers
64242 – Domestic non-scheduled air transport services of passengers
64243 – International scheduled air transport services of passengers
64244 – International non-scheduled air transport services of passengers
64250 – Space transport services of passengers
66031 – Rental services of passenger aircraft with operator
5120 - Freight air transport
65311 – Air transport services of letters and parcels
65319 – Air transport services of other freight
65320 – Space transport services of freight
66032 – Rental services of freight aircraft with operator
5310 - Postal activities
65311 – Air transport services of letters and parcels
5320 - Courier activities
65311 – Air transport services of letters and parcels
8690 - Other human health activities
93194 - Ambulance services
2. General aviation
0161 - Support activities for crop production
86119 – Other support services to crop production (incl. aerial spreading and spraying)
0162 - Support activities for animal production
86122 – Support services to farm animal husbandry
7420 - Photographic activities
83814 – Specialty photography services (incl. aerial photography)
8423 - Public order and safety activities
91260 – Police and fire protection services (incl. aerial police and air-sea rescue services)
7310 – Advertising

83619 – Other advertising services (incl. aerial advertising services)

7110 - Architectural and engineering activities and related technical consultancy

83322 – Engineering services for industrial and manufacturing projects

83323 – Engineering services for transportation projects

83421 – Surface surveying services

7120 - Technical testing and analysis

83443 – Testing and analysis services of integrated mechanical and electrical systems

8549 - Other education n.e.c.

92919 – Other education and training services n.e.c. (incl. flight training)

5110 - Passenger air transport

64134 – Sightseeing services by air

64250 – Space transport services of passengers

5120 - Freight air transport

65320 – Space transport services of freight

9319 - Other sports activities

96590 – Other sports and recreational sports services

7210 - Research and experimental development on natural sciences and engineering

81114 – Basic research services in engineering and technology

81124 – Applied research services in engineering and technology

81134 – Experimental development services in engineering and technology

3. Airport services

4922 - Other passenger land transport

64114 – Local special-purpose scheduled road transport services of passengers

64115 – Taxi services

64222 – Interurban special-purpose scheduled road transport services of passengers

5223 - Service activities incidental to air transportation

67610 – Airport operation services (excl. cargo handling)

67620 – Air traffic control services

67630 – Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)

67640 – Supporting services for space transport

5224 - Cargo handling

67110 – Container handling services

67190 – Other cargo and baggage handling services

6810 - Real estate activities with owned or leased property

72112 – Rental or leasing services involving owned or leased non-residential property

6820 - Real estate activities on a fee or contract basis

72212 – Non-residential property management services on a fee or contract basis

4. Air navigation services

5223 - Service activities incidental to air transportation

67620 – Air traffic control services

67640 – Supporting services for space transport

5229 - Other transportation support activities

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

5. Maintenance and overhaul

3313 - Repair of electronic and optical equipment

87154 – Maintenance and repair services of medical, precision and optical instruments

3315 - Repair of transport equipment, except motor vehicles

87149 – Maintenance and repair services of other transport equipment (incl. aircraft and aircraft engines)

5223 - Service activities incidental to air transportation

67630 – Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)

6. Regulatory functions

5229 - Other transportation support activities

679** – Other supporting transport services

67910 – Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

7120 - Technical testing and analysis

83449 – Other technical testing and analysis services

8413 - Regulation of and contribution to more efficient operation of businesses

91134 – Public administrative services related to transport and communications (incl. public administrative services related to air transport)

7. Aviation training

8522 - Technical and vocational secondary education

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

8530 - Higher education

92919 – Other education and training services n.e.c. (incl. flight training)

8549 - Other education n.e.c.

92919 – Other education and training services n.e.c. (incl. flight training)

8. Other activities

5210 - Warehousing and storage

67210 – Refrigerated storage services

67220 – Bulk liquid or gas storage services

67290 – Other storage and warehousing services

5229 - Other transportation support activities

67910 – Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

7730 - Renting and leasing of other machinery, equipment and tangible goods

73114 – Leasing or rental services concerning other land transport equipment without operator

73116 – Leasing or rental services concerning aircraft without operator

8110 - Combined facilities support activities

8121 - General cleaning of buildings

8129 - Other building and industrial cleaning activities

853** – Cleaning services

85310 – Disinfecting and exterminating services (incl. for aircraft)

85340 – Specialized cleaning services (incl. aircraft)

94510 – Sweeping and snow removal services (incl. runway cleaning and snow removal)

B. Classifications of aviation connected products

3.11 Aviation connected products comprise other products according to their relevance for aviation analysis but do not satisfy the criteria mentioned in para. 3.8.

3.12 For the supply of civil aviation products, the civil aviation industries use a wide range of goods and services from other industries such as the manufacture of refined petroleum products (e.g. kerosene, oil, jet fuel for the use in aircraft), food and beverage (e.g. airline catering), financial services (e.g. aircraft leasing) and all of the supporting goods and services. Some products purchased from other industries are, for example:

- a. the use of aircraft to provide air transport services;
- b. petroleum and chemical products, such as kerosene, oil, de-icing/anti-icing fluid;
- c. automated booking services through computer reservation systems (CRS);
- d. in-flight catering and entertainment; and
- e. electronic and communication equipment, business support functions in financing, insurance, advertising, marketing and many other non-aviation products and services.

3.13 The connected products are interesting because they are clearly covered by their use in a given characteristic industry, without being typical, either by nature or because their main production activities are classified in other industries.

3.14 For aviation connected products, there is no particular interest in showing how they are produced because they are not typical of the field of interest. If the conditions of production are important, then the items should be considered characteristic products and not connected products. The precise borderline between characteristic and connected products depends on the economic organization in a given country and the ASA.

3.15 The full list of all civil aviation characteristic and connected products is presented in Appendix 3.

3.16 Countries might also decide, when relevant, to create specific subcategories of some of the CPC subclasses that are listed in Appendix 3 in order to focus more specifically on the measurement of a product of particular interest. The same would apply to any eventual disaggregation at the 5-digit level of important 4-digit ISIC classes.

Chapter 4. Compilation of the Supply-Use Tables

4.1 2008 SNA recommends that it is almost always useful to develop a set of Supply and Use Tables (SUTs) for the characteristic and connected products of interest and the producers of the characteristic products. This may be extended to cover the generation of income account also and non-monetary data concerning employment and indicators of output.

4.2 Following the 2008 SNA, it is recommended to first compile civil aviation supply and use tables. The SUTs allow for the coherent measurement of the economic information. Civil aviation industries have relatively complete measures of physical activities, and creating SUTs based on data available from each establishment will provide detailed economic statistics.

A. General Overview of the Supply and Use Table

4.3 The United Nations Department of Economic and Social Affairs published, in 2018, a *Handbook on Supply, Use and Input-Output Tables with Extensions and Applications*. An extract of the overview of the SUTs is presented in this chapter. The document is available at: https://unstats.un.org/unsd/nationalaccount/docs/SUT_IOT_HB_wc.pdf.

4.4 Supply and Use Tables describe the whole economy by industry and product. The tables show links between components of gross value added (GVA), industry inputs and outputs, and product supply and use. The SUTs link different institutional sectors of the economy with detailed imports and exports of goods and services, final consumption, expenditures of government, household and non-profit institutions serving households (NPISHs), and capital formation.

4.5 As the name suggests, Supply and Use Tables consist of two interlinked tables: the Supply Table and the Use Table. The Supply Table shows the supply of goods and services by type of product and by type of industry, distinguishing between the supply by domestic industries and imports of goods and services. In other words, the Supply Table provides information on the output (by product) generated by economic activities and the imports (by product) from abroad. The totals in the last column represent the total supply by products and the totals in the bottom row represent the total output by economic activity and total imports. An example of the simplified structure of a Supply Table is presented in Table 4.1.

Table 4.1: Simplified structure of the Supply Table

Products \ Industries	Industries				Imports	Total
	Agriculture, forestry, etc.	Mining and quarrying	...	Services		
Agriculture, forestry, etc.	Output by product by industry				Imports by product	Total supply by product
Ores and minerals; etc.						
...						
Services						
Total	Total Output by Industry				Total imports	Total supply

4.6 The second table is the Use Table, which provides information on the uses of the different products. The Use Table shows the use of goods and services by type of product and by type of use, i.e. as intermediate consumption by industry, final consumption, and gross capital formation or exports. Furthermore, the table shows the components of GVA by industry - namely, compensation of employees, other taxes less subsidies on production, consumption of fixed capital and net operating surplus. While the totals by row represent the total uses by product, the totals by column represent the total output by economic activity, total final consumption, total gross fixed capital formation and total exports. Table 4.2 shows an example of a simplified structure of the Use Table.

Table 4.2: Simplified structure of the Use Table

Products \ Industries	Industries				Final uses			Total
	Agriculture, forestry, etc.	Mining and quarrying	...	Services	Final consumption	Gross capital formation	Exports	
Agriculture, forestry, etc. Ores and minerals; etc. ... Services	Intermediate consumption by product and by industry				Final uses by product and by category			Total use by product
Value added	Value added by component and by industry							Value added
Total	Total Output by industry				Total final uses by category			

Empty cells by definition

4.7 The classification of products, in practice, is often more detailed than the classification of industries, thus generating rectangular SUTs. For example, the output of the dairy industry is shown separately in the SUTs for the individual products of processed milk, butter, yoghurt, cheese, etc. and not as only one aggregate product for all dairy products.

4.8 Once balanced, the Supply Table and the Use Table can be integrated into a single matrix - often referred to as the Supply and Use Tables (SUTs) framework, which is shown in Table 4.3. This table clearly shows the two basic identities linking the SUTs. The total supply by product (left part of bottom row of Table 4.3) equals the total use by product (the top part of the last column of Table 4.3) and the total output by industry are identical in both SUTs (the middle part of the bottom row equals the middle part of the last column).

Table 4.3: Supply and Use Tables framework

	Products				Industries				Final uses			Total
	Agriculture, forestry, etc.	Ores and minerals; etc.	...	Services	Agriculture, forestry, etc.	Mining and quarrying	...	Services	Final consumption	Gross capital formation	Exports	
Products	Intermediate consumption by product and by industry				Final uses by product and by category			Total use by product				
Industries	Output by product by industry							Total output by industry				
Value added	Value added by component and by industry							Value added				
Imports	Total imports by product							Total imports				
Total	Total supply by product				Total output by industry			Total final uses by category				

Empty cells by definition

SUTs bring together the components of each of the three approaches to measuring GDP - namely, the production, income and expenditure approaches.

Production approach:

GDP = Output (at basic prices) - Intermediate consumption + Taxes less subsidies on products

Income approach:

GDP = Compensation of employees + Gross operating surplus + Other taxes less subsidies on production + Taxes less subsidies on products

Expenditure approach:

GDP = Final consumption + Gross capital formation + Exports - Imports

B. Overview of the Civil Aviation Supply and Use Tables

4.9 Table 4.4 is a summary of the whole supply table for civil aviation. The left side of the table shows different categories of goods and services, which will be provided to civil aviation and other industries. The complete Supply Table with detailed components of each group is presented in Appendix 4. The top row in the table below shows the group of industries which comprises “civil aviation”, namely:

- Commercial air transport,
- General aviation,
- Airport services
- Air navigation services
- Maintenance and overhaul
- Regulatory functions
- Aviation training
- Other activities (of civil aviation)
- In-house aviation

4.10 Total outputs of these industries will be shown as Total Domestic Output. In order to show the total civil aviation supply, we will include imports (of civil aviation products), plus tax less subsidies.

4.11 Following this, all other industries including civil aviation associated industries, will be aggregated into one column under “All Other Industries”. Each group may have multiple industries after disaggregation, showing details of transactions on an annual basis. While non-civil aviation industries are aggregated into a single column, a nation is still able to add the economic activities of those associated industries as a module on top of the civil aviation category. We will discuss “In-House Transportation” further in the next chapter.

4.12 The summary Use Table for civil aviation is shown in Table 4.5. The structure of the table is similar to the Supply Table. The complete Use Table with detailed components of each group is presented in Appendix 5.

Table 4.4 Supply Table for civil aviation industries (summarized version)

	CIVIL AVIATION INDUSTRIES								Total domestic output by Civil Aviation	Imports of Civil Aviation products	Taxes less subsidies on Aviation products	All Other Industries	Total domestic output	Imports	Taxes less subsidies on products	Total Supply
	Commercial air transport services	General aviation	Airport services	Air navigation services	Maintenance and overhaul	Regulatory functions	Aviation training	Other activities								
Civil aviation characteristic and connected products																
Commercial air transport services characteristic products																
General aviation characteristic products																
Airport services characteristic products																
Air navigation services characteristic products																
Maintenance and overhaul characteristic products																
Regulatory functions characteristic products																
Aviation training characteristic products																
Other characteristic products																
Civil aviation connected products																
TOTAL Industry Output																

4.13 The lower section of the left side shows total intermediate inputs, total value added, compensation of employees, operating surplus and indirect taxes. The right side of the top three rows, after All Other Industries, shows total intermediate consumption, household and government consumption, gross capital formation and exports, before the final column: Total Use.

4.14 The third column from the far right shows “Gross Capital Formation”. If the production activities of goods or services of any industries involve the creation of assets that are not immediately consumed but have longer life than one year, this column is the place to display such formation of capital. This will enable readers to see which industries contributed to capital formation.

4.15 “Export” is the foreign income earned by the sales of civil aviation products while “Import” is the foreign exchange spending on the same. Export is primarily due to the sale of passenger and cargo transportation by domestically registered carriers to foreign consumers with the point of sale being inside and outside the State. Import is mainly due to the consumption by consumers of a country of passenger and cargo transportation from foreign air carriers.

4.16 Either of the three approaches of measuring GDP indicated above will arrive at the direct economic contribution to the GDP from civil aviation. The approaches, serve in the cross validation of the direct economic contribution of civil aviation to the nation’s GDP.

Chapter 5. In-house civil aviation

5.1 There can be some countries in which large operations in agriculture, mining, manufacturing and services are utilizing civil aviation products. Transporting passengers and freight from one place to the other, such as off-shore drilling or mining in remote areas, or large-scale spraying of pesticides may require the company's own non-commercial aviation services. These civil aviation activities have not been traditionally captured as such, but rather formed a part of operating expenses involved in conducting their main businesses.

5.2 The ASA aims to capture these activities. Our goal is to extract the hidden economic activities of civil aviation, and the process of identifying in-house aviation (IHA) will be relevant to this goal.

5.3 This chapter provides a simplified approach of capturing the in-house aviation component that is embedded in the supply and use of non-aviation industries. The approach to estimating the IHA outputs and inputs of non-aviation industries involves the following steps:

- a. Identify the most essential inputs used predominantly for civil aviation and estimate the value of total supply of this input available for IHA activities.
- b. Estimate the total value of all other aviation related inputs (ARIs) and non-aviation related inputs (nARIs) available for IHA activities.
- c. Estimate the total GVA generated by the IHA activities.
- d. Allocate the output from IHA activities across non-aviation industries using in-house transportation.

A1. Determining the availability of the essential ARI for in-house aviation

5.4 Any industry producing in-house aviation must consume fuel to power aircraft. It is recommended that the CPC codes related to aviation fuel be considered as the essential ARI (eARI) for the purposes of determining IHA.

5.5 It is important to determine the total value of the essential ARI (eARI) that is supplied by the non-aviation industry and the value of the eARI that is used by the aviation industry. The ASA Use Table will show the latter while the supply of the total eARI is captured in the general Supply Table under the SNA framework, or alternatively, determined from the accounts of the non-aviation Industry that is supplying this essential input.

5.6 The differential between the total supply of aviation fuel and its use by the civil aviation industry will be the total value of the eARI attributable to the activities of the non-aviation industries and households.

5.7 The formula to determine the total essential aviation related input used by non-aviation:

$$TeARI_{NonAir} = TeARI_{All} - TeARI_{Air}$$

A2. Estimating the value of all other intermediary inputs used for IHA activities

5.8 Once the total economic share of the eARI that is used by IHA is determined, the next step is to estimate the total value of all the other intermediary inputs (ARIs and nARIs) that go into delivering the IHA. The Use Table of the ASA will provide details of all the intermediate inputs used by the civil aviation industries in delivering the final demand product. This can be used as a proxy for the non-aviation industries providing IHA activities. Once all the inputs have been identified, the factor of these inputs to the eARI can be computed using the Use Table. The following Table shows the factors for some of the major intermediate inputs by commercial air transport and general aviation, and is provided for general reference and benchmarking:

Commodity code	Type	Factor
Aviation fuel	eARI (essential)	1.00
Maintenance of aircraft	ARI (Direct)	0.05
Airport charges	ARI (Direct)	0.09
Non direct overhead (office rent etc.)	nARI	0.08

Source – ICAO Air Transport Reporting Form EF

The formula to determine the total intermediate input used by the non-aviation industries is:

$$TII_{NonAir} = TeARI_{NonAir} + \sum_{i=1}^n f_i TeARI_{NonAir}$$

Where n is the number of input factors

5.9 It is important to mention that if a country has a detailed SNA account framework methodology already implemented, then it can use the intermediate inputs of the civil aviation industry that are used by the non-aviation industries in its SNA accounts to replace the estimation of the factors or to reduce the need for estimation of the intermediate inputs as suggested in this chapter.

A3. Estimating the Gross Value Added

5.10 Once the total value of all intermediary inputs that are used for IHA activities is estimated, the next step is to estimate the total Gross Value Added. The use table in the ASA will again

provide details of these as a proportion to the total intermediary input for commercial air transport and general aviation in delivering the final use air transportation product. The total industry output from IHA activities can be estimated by summing the intermediate consumption and the GVA. The following table compiled from reported statistical data to ICAO is provided for general reference and benchmarking:

Type	Factor	Applied on
Gross Value Added	0.03	Total intermediate inputs

Source – ICAO Form EF

$$TGVA_{NonAir} = f * TII_{NonAir}$$

$$TOUT_{NonAir} = TII_{NonAir} + TGVA_{NonAir}$$

5.11 Arguments have been presented for excluding aviation industries Gross Value Added when estimating the IHA activities. The rationale is that IHA are non-market services and that the price paid is equal to the intermediate inputs expended for delivering the service. However, the provision of the IHA provides value that is reflected in the output of the commodities supplied by the non-aviation industry which is passed on to the final consumer. Therefore, it is suggested that the GVA is estimated and included in the measurement of IHA.

A4. Allocation of the use of in-house aviation to non-aviation industries

5.12 Once the total output i.e. the sum of intermediate inputs and GVA has been estimated, the same is allocated to the non-aviation industries that used IHA. This allocation is based on a set of industry weights that approximate the relative size of aviation activities in non-aviation industries. It is suggested that the industry weights, depending on availability of data, be based on:

- a. aircraft operation (flying hours) by ownership of the aircraft, obtained from the records of the civil aviation authority or transport authority of the State.

If this information is unavailable, the calculation should be based on:

- b. employment counts of pilots i.e. essential aviation workers in non-aviation industries, obtained from the Census of Population and or licensed personnel (pilots) registry data of the State.

5.13 The industry weights are calculated as a ratio of the aircraft operations (flying hours) in the non-aviation industries to total aircraft operations across all industries or the employment of the essential aviation worker in the non-aviation industry to the total employment of the essential aviation worker across all industries. The industry weights are used to allocate the total IHA output to each non-aviation industry that has generated the IHA activity.

5.14 If the employment or aircraft operations attributable to households is deemed significant by the State, then the allocation of the total IHA output is adjusted by including the household component while calculating the industry weights.

5.15 Adjustments are then made to the IHA estimates to ensure coherency with the SUTs. Use of the IHA commodity that appears in an industry where it would be highly implausible is removed. If the level of ARI's seems unreasonable, it is reduced and offset in another appropriate industry where possible. An effort is also made to ensure no negative values result from moving the intermediate inputs from the non-aviation industries to the IHA industry.

A5. Incorporating IHA in the Aviation Satellite Account

5.16 The total IHA output as determined in Step A3 will align under the In-house Aviation Industry column and the IHA commodity row column in the ASA Supply Table shown in Chapter 4.

5.17 In the Use Table of the ASA, the intermediate inputs as determined in Step A2 will be listed under the IHA Industry column for the appropriate commodity rows relating to the intermediate input in the ASA Use Table shown in Chapter 4.

5.18 To determine the industries that use in-house air transportation, it is recommended that the Supply of the IHA i.e. total output as determined in step A1 be allocated to the non-aviation industries as determined in step A4 and shown under the supplementary tables in Chapter 6. This will help policy makers to gauge the industries that rely on in-house aviation.

5.19 The final step is to rearrange the Supply and Use Table wherein the total output and intermediate inputs allocated across the various industries using IHA, as determined in step A4, is extracted from the output and inputs of these industries and reflected in a separate column 'In-house Transportation'. The aviation component of in-house transportation columns in the main Supply and Use Tables should be the in-house aviation column in the ASA tables.

Chapter 6. Data Tables

This chapter contains a list of suggested socio-economic indicators that national accountants and policy makers can refer to in order to interpret the current or future investments in the civil air transport industry. These indicators can also facilitate an impact analysis of the effects of policy changes or policy initiatives in civil air transport. At a more macro level, it will also provide a guide on the general health of the air transport sector relative to the overall economy,

Table 1

GDP and GVA of Civil Aviation Industries (Year ---)

	Industry code --	Industry code --	Total
Output			
Intermediate consumption			
Aviation gross value added			
Compensation of employees			
Taxes less subsidies on production			
Gross operating surplus/Mixed income			
Taxes less subsidies on products			
Aviation GDP			

Table 1 will be compiled using the SUT framework suggested in Chapter 4 and the detailed Supply Use Tables indicated in the Appendices 4 and 5. The direct economic contribution to the GDP, as well as to the GVA, employee compensation and indirect taxes can be seen by type of civil aviation industry of the State.

Table 2

Employment and Traffic of Civil Aviation Industries (Year--)

This table also provides the physical parameters of employee count and total traffic carried that form the final consumption of the civil aviation industries of the State.

	Number of establishments	Number of employees		
		Male	Female	Total
Industry code --				
Industry code --				
Total				

	Passengers carried	Cargo tonnes carried	E-commerce parcels carried
--	--------------------	----------------------	----------------------------

Industry code --			
Industry code --			
Total			

This table highlights the importance of civil aviation in the movement of passengers, cargo and e-commerce worldwide and the jobs that are created in order to provide this service. The movement of passengers and cross border commodity flows is critical for the growth of tourism and businesses. The civil aviation industry is the prime facilitator, without which the full social economic potential of tourism and business cannot be achieved.

Table 3

Imports and exports of Civil Aviation Industries (Year--)

This table provides the imports and exports of the main products consumed by and the products supplied by the civil aviation Industry. This table will be compiled using the suggested SUT framework in Chapter 4 and the detailed Supply Use Tables indicated in Appendices 4 and 5.

Imports of Civil Aviation Industries

	Industry code	Industry code	Total
Product code --			
Product code --			
Total			

Exports of Civil Aviation Industries

	Industry code	Industry code	Total
Product code --			
Product code --			
Total			

Policy makers can group the imports and exports by the civil air transport industry, indicating the potential net foreign exchange inflows due to the products being supplied by the civil aviation industry.

Table 4

Value of commodities moved by Air Transport (Year---)

This table will detail the value of commodities transported by all the civil aviation industries relative to the value of those carried by other modes of transport.

Mode of Transport	CIF Value of Imports and Exports (US\$)
Air Transport Mode	
Other Transport Modes	
Total	

Table 5

Tourists carried by air transport and tourism spends

This table shows the total tourist arrivals and the tourism spends by mode of transport. Policy makers can gauge the importance of the role that civil aviation industries play in the development of tourism in a State relative to other transport modes.

Mode of transport	Tourism arrivals	Tourism spend
Air transport mode		
Other transport modes		
Total		

Table 6

Gross Capital Formation (Year---)

The table shows the gross capital formation from the products supplied by the associated industries related to civil aviation. These capital goods supplied by the associated industries i.e. civil aviation manufacturing and civil aviation construction industries are the fixed assets or the capital formation in the ledgers of the civil aviation industry. The table will also segment the imports and exports element in the gross capital formation. This table will be compiled using the SUT framework in Chapter 4 and the detailed Supply Use Tables indicated in the Appendices 4 and 5.

Gross capital formation	Industry code	Industry code	Total
Aviation specific assets			
Gross fixed capital formation by type of asset			
<i>Dwellings</i>			
<i>Other buildings and structures</i>			
<i>Buildings other than dwellings</i>			
<i>Other structures</i>			
<i>Land improvements</i>			
<i>Machinery and equipment</i>			
<i>Transport equipment</i>			
<i>ICT equipment</i>			
<i>Other machinery and equipment</i>			
<i>Costs of ownership transfer on non-produced assets</i>			
<i>Intellectual property products</i>			
<i>Research and development</i>			
<i>Computer software and databases</i>			
<i>Computer software</i>			
<i>Databases</i>			
<i>Other intellectual property products</i>			
Changes in inventories			
<i>Materials and supplies</i>			
<i>Work-in-progress</i>			
<i>Work-in-progress on cultivated biological assets</i>			
<i>Other work-in-progress</i>			
<i>Finished goods</i>			
Acquisitions less disposals of valuables			
Acquisitions less disposals of non-produced assets			
Acquisitions less disposals of natural resources			
<i>Land</i>			
<i>Other</i>			
Acquisitions less disposals of contracts, leases and licences			
<i>Contracts, leases and licences</i>			
<i>Marketable operating leases</i>			
<i>Permits to use natural resources</i>			
<i>Permits to undertake specific activities</i>			
<i>Entitlement to future goods and services on an exclusive basis</i>			
Purchases less sales of goodwill and marketing assets			

Chapter 7. Capacity-building and Outreach

7.1 The Aviation Satellite Account methodological framework is the first edition of its kind and should be considered as the international standard for aviation economic accounting. The ASA enables States to make data-driven policy-making and evaluation for aviation development planning which is linked with national and/or regional development frameworks and strategies. Furthermore, financial institutions and investors will be able to use these data to estimate, for example, the GVA of government budgets (taxpayer funding) and private investment in the aviation sector.

7.2 Efforts by States are required to raise awareness and promote the acceptance of the methodological framework of the ASA, including initiatives by national statistical offices, central banks, transport authorities and other ministries in charge of related portfolios such as finance, economic planning and trade. In addition, it is necessary to provide technical assistance to States to encourage the implementation of the methodological framework and to set up their own ASAs to measure the contribution of aviation to national economies.

7.3 While this is a valid business model to disseminate knowledge to national statistics experts in national statistics offices, central banks, and government offices, there is also a need to reach out to broader audiences, including users of similar frameworks in order to spread awareness of the relative importance of the industry to a wider audience of consumers. Broader audiences would include, but not be limited to policymakers, local government officials, and senior management in the industry who are experts in the industry but are not familiar with the SNA or Input-Output framework.

7.4 Focus should be placed on two main types of users/audiences to enhance capacity-building for the implementation of the ASA methodological framework, based on the characteristics of those users:

- a. Primary focus should be on professional statisticians and aviation statistics specialists who will be mainly in charge of building the ASA. National statisticians have knowledge of the SNA but may not necessarily be familiar with aviation specific statistics. Aviation statistics specialists have deep knowledge of aviation statistics. However, they are not necessarily familiar with the SNA. Comprehensive guidance should be provided to these experts on how to compile the tables required for the ASA using the statistical data available within States and/or national accounting offices. ICAO will develop guidelines and use its existing framework to devise training so that States can become familiar with how to set up an ASA, complete the required tables, and link them to the existing national accounting framework.
- b. The second group should be the broader users/audiences that include not only professional statisticians and aviation statistics specialists, but also other consumers of aviation statistics, such as government officials who are neither government statisticians nor aviation statistics specialists. Policy-makers may not have prior knowledge of either the SNA or aviation-specific statistics. Capacity-building for these audiences should focus on which information

is available or can be derived from the completion of the ASA, and how to use the information for policy-making.

- c. Guidance on the practical implementation of the ASA methodological framework by States will be compiled into a second version of the document. It will clearly outline the sources of data, both that collected through the ICAO Statistics Programme as well as those collected by the national accounting offices. Detailed guidance will also be provided on how to apply the data for compiling the tables that form part of the account.

7.5 In order to disseminate new knowledge on the ASA as a global methodology to measure the economic activities of aviation industries, ICAO, together with the UNSD, will continue to provide training in the form of physical workshops and seminars. At the initial stage of launching the ASA, workshops can be organized for experts nominated by States, either at ICAO headquarters or at regional locations. These experts can share the acquired knowledge with their nations. Also, workshops and training can be organized at the request of a specific region or State.

7.6 ICAO will provide capacity-building and assistance to Member States and regional authorities to conduct studies using the ASA methodological framework as to the current and expected socio-economic contribution from civil aviation. The organization will also embed the methodology in its aviation infrastructure programme to assist States in aligning the financing schemes and policy initiatives of infrastructure development with the needs and expected returns based on analysis using reliable economic measures.

Appendix 1

List of civil aviation characteristic activities (civil aviation industries) and grouping by main categories according to ISIC Rev.4

Civil aviation industries	ISIC Rev. 4	Description
1. Commercial air transport services		
1.1. Scheduled	5110	Passenger air transport
	5120	Freight air transport
	5310	Postal activities
	5320	Courier activities
1.2. Non scheduled		
1.2.1. Charter	5110	Passenger air transport
	5120	Freight air transport
	5310	Postal activities
	5320	Courier activities
1.2.2. On-demand	8690	Other human health activities (air ambulance)
1.2.3. Other non-scheduled		
2. General aviation		
2.1. Aerial work		
2.1.1. Agriculture	0161	Support activities for crop production
	0162	Support activities for animal production
2.1.2. Photography	7420	Photographic activities
2.1.3. Observation and patrol	8423	Public order and safety activities
2.1.4. Aerial advertisement	7310	Advertising
2.1.5. Construction	4390	Other specialized construction activities
2.1.6. Surveying	7110	Architectural and engineering activities and related technical consultancy
2.1.7. Search and rescue	8423	Public order and safety activities
2.1.8. Other aerial work		
2.2. Instructional flying	8549	Other education n.e.c
2.3. Pleasure flying	5110	Passenger air transport
	9319	Other sports activities
2.4. Other flying	5120	Freight air transport
	7120	Technical testing and analysis
	7210	Research and experimental development on natural sciences and engineering
3. Airport services		
3.1. Aeronautical services	4922	Other passenger land transport
	5223	Service activities incidental to air

		transportation
	5224	Cargo handling
3.1. Non-aeronautical services	6810	Real estate activities with owned or leased property
	6820	Real estate activities on a fee or contract basis
4. Air navigation services		
	5223	Service activities incidental to air transportation
	5229	Other transportation support activities
5. Maintenance and overhaul		
	3313	Repair of electronic and optical equipment
	3315	Repair of transport equipment, except motor vehicles
	5223	Service activities incidental to air transportation
6. Regulatory functions		
	5229	Other transportation support activities
	7120	Technical testing and analysis
	8413	Regulation of and contribution to more efficient operation of businesses
7. Aviation training		
	8522	Technical and vocational secondary education
	8530	Higher education
	8549	Other education n.e.c.
8. Other activities		
	5210	Warehousing and storage
	5229	Other transportation support activities
	7730	Renting and leasing of other machinery, equipment and tangible goods
	8110	Combined facilities support activities
	8121	General cleaning of buildings
	8129	Other building and industrial cleaning activities
	8130	Landscape care and maintenance service activities

Explanatory notes

These explanatory notes refer exclusively to internationally comparable civil aviation characteristic activities and follow the same order as in the table above.

They have been extracted from *International Standard Industrial Classification of All Economic Activities (ISIC), Rev. 4*, United Nations, New York, 2008.

The complete document can be consulted in <http://unstats.un.org/unsd/cr/registry/isic-4.asp>

1. COMMERCIAL AIR TRANSPORT SERVICES

1.1. Scheduled

ICAO definition: Scheduled services (revenue) are flights scheduled and performed for remuneration according to a published timetable, or so regular or frequent as to constitute a recognizably systematic series, which are open to direct booking by members of the public; and extra section flights occasioned by overflow traffic from scheduled flights.

Mapping with ISIC Rev.4

5110 – Passenger air transport

This class includes:

- *transport of passengers by air over regular routes and on regular schedules*
- *charter flights for passengers*
- *scenic and sightseeing flights*

This class also includes:

- *renting of air-transport equipment with operator for the purpose of passenger transportation*
- *general aviation activities, such as:*
 - *transport of passengers by aero clubs for instruction or pleasure*

5120 – Freight air transport

This class includes:

- *transport freight by air over regular routes and on regular schedules*
- *non-scheduled transport of freight by air*
- *launching of satellites and space vehicles*
- *space transport*

This class also includes:

- *renting of air-transport equipment with operator for the purpose of freight transportation*

5310 – Postal activities

This class includes the activities of postal services operating under a universal service obligation.

This class includes:

- *pickup, sorting, transport and delivery (domestic or international) of letter-post and (mail-type) parcels and packages by postal services operating under a universal service obligation. One or more modes of transport may be involved and the activity may be carried out with either self-owned (private) transport or via public transport.*
- *collection of letter-mail and parcels from public letter-boxes or from post offices*
- *distribution and delivery of mail and parcels*

5320 Courier activities

This class includes courier activities not operating under a universal service obligation.

This class includes:

- *pickup, sorting, transport and delivery (domestic or international) of letter-post and (mail-type) parcels and packages by firms not operating under a universal service obligation. One or more modes of transport may be involved and the activity may be carried out with either self-owned (private) transport or via public transport.*
- *distribution and delivery of mail and parcels*

This class also includes:

- *home delivery services*

This class excludes:

- *transport of freight, see (according to mode of transport) 4912, 4923, 5012, 5022, 5120*

1.2. Non-scheduled

ICAO definition: A non-scheduled air service is a commercial air transport service performed as other than a scheduled air service.

1.2.1. Charter

ICAO definition: A charter flight is a non-scheduled operation using a chartered aircraft. Though the terms non-scheduled and charter (i.e. a contractual arrangement between an air carrier and an entity hiring or leasing its aircraft) have come to be used interchangeably, it should be noted that not all commercial non-scheduled operations are charter flights.

Mapping with ISIC Rev.4

5110 – Passenger air transport (same as indicated in 1.1)

- *...charter flights for passengers*

5120 – Freight air transport (same as indicated in 1.1)

- *...non-scheduled transport of freight by air*

5310 – Postal activities (same as indicated in 1.1)

5320 – Courier activities (same as indicated in 1.1)

1.2.2. On-demand

8690 – Other human health activities (air ambulance)

This class also includes...

...ambulance transport of patients by any mode of transport including airplanes.

...activities of blood banks, sperm banks, transplant organ banks, etc.

1.2.3. Other non-scheduled

Other non-scheduled commercial air transport not categorized as charter or on-demand.

2. GENERAL AVIATION

2.1. Aerial work

2.1.1. Agriculture

Agricultural spreading/spraying

0161 – Support activities for crop production

This class includes agricultural activities on a fee or contract basis:

...crop spraying, including by air

Mustering

0162 – Support activities for animal production

This class includes agricultural activities on a fee or contract basis...

- *...activities to promote propagation, growth and output of animals*
- *...herd testing services, droving services, agistment services, poultry caponizing, coop cleaning, etc.*

2.1.2. Photography

7420 – Photographic activities

This class includes...

...aerial photography

2.1.3. Observation and patrol

8423 – Public order and safety activities

This class includes...

- *...administration and operation of regular and auxiliary **police** forces supported by public authorities and of **port, border, coast guards** and other special police forces, including traffic regulation, alien registration, maintenance of arrest records*

Firefighting and fire prevention:

- *...administration and operation of regular and auxiliary **fire brigades in fire prevention, firefighting, rescue** of persons and animals, assistance in civic disasters, floods, road accidents, etc.*

2.1.4. Aerial advertisement

7310 – Advertising

This class includes...

...aerial advertising

2.1.5. Construction

- Sling loads

4390 – Other specialized construction activities

This class includes construction activities specializing in one aspect common to different kind of structures, requiring specialized skills or equipment:

...subsurface work

...renting of cranes with operator

2.1.6. Surveying

- Pipeline or power surveying
- Surveying – other

7110 – Architectural and engineering activities and related technical consultancy

This class includes the provision of architectural services, engineering services, drafting services, building inspection services and surveying and mapping services and the like.

This class includes:

...geophysical, geologic and seismic surveying

...geodetic surveying activities

2.1.7. Search and rescue

8423 – Public order and safety activities (same as indicated in 2.1.3)

2.1.8. Other aerial work

2.2. Instructional flying

8549 – Other education n.e.c.

This class includes the provision of instruction and specialized training, generally for adults, not comparable to the general education in groups 851–853. This class does not include activities of academic schools, colleges, and universities. Instruction may be provided in diverse settings, such as the unit's or client's training facilities, educational institutions, the workplace, or the home, and through correspondence, radio, television, Internet, in classrooms or by other means. Such instruction does not lead to a high school diploma, baccalaureate or graduate degree.

This class also includes...

- *...flying schools*

2.3. Pleasure flying

- Glider towing
- Aerobatics
- Pleasure and personal transport
- Community service flights

5110 – Passenger air transport (same as indicated in 1.1)

This class also includes...

- *...general aviation activities, such as transport of passengers by aero clubs for instruction or pleasure*

- Parachute dropping
- Joy flights/sightseeing charters

5110 – Passenger air transport (same as indicated in 1.1)

This class includes...

- *...scenic and sightseeing flights*

9319 – Other sports activities

This class includes...

- *...support activities for sport or recreational hunting and fishing*

2.4. Other flying

- Test flights
- Ferry flights
- Other flights

5120 – Freight air transport (same as indicated in 1.1)

This class includes...

- *...launching of satellites and space vehicles*
- *...space transport*

7120 – Technical testing and analysis

This class includes...

- ...certification of products, including consumer goods, motor vehicles, aircraft, pressurized containers, nuclear plants, etc.
- ...testing with use of models or mock-ups (e.g. of aircraft, ships, dams, etc.)

7210 – Research and experimental development on natural sciences and engineering

This class includes...

- research and experimental development on natural science and engineering:
 - ...research and development on engineering and technology
 - ... interdisciplinary research and development, predominantly on natural sciences and engineering

3. AIRPORT SERVICES

3.1. Aeronautical services

4922 – Other passenger land transport

This class includes...

- ...airport shuttles

5223 – Service activities incidental to air transportation

This class includes activities related to air transport of passengers, animals or freight:

- ...operation of terminal facilities such as airway terminals, etc.
- ...airport and air-traffic-control activities
- ...ground service activities on airfields, etc.

This class also includes:

- ...firefighting and fire-prevention services at airports

5224 – Cargo handling

This class includes:

- loading and unloading of goods or passengers' luggage irrespective of the mode of transport used for transportation
- stevedoring
- loading and unloading of freight railway cars

3.2. Non-aeronautical services

- o Airport concessions

6810 – Real estate activities with own or leased property

This class includes:

—buying, selling, renting and operating of self-owned or leased real estate, such as:

- apartment buildings and dwellings
- non-residential buildings, including exhibition halls, self-storage facilities, malls and shopping centers

- *land*
—provision of homes and furnished or unfurnished flats or apartments for more permanent use, typically on a monthly or annual basis

This class also includes:

- development of building projects for own operation, i.e. for renting of space in these buildings
- subdividing real estate into lots, without land improvement
- operation of residential mobile home sites

6820 – Real estate activities on a fee or contract basis

This class includes the provision of real estate activities on a fee or contract basis including real estate related services.

This class includes:

- *activities of real estate agents and brokers*
- *intermediation in buying, selling and renting of real estate on a fee or contract basis*
- *management of real estate on a fee or contract basis*
- *appraisal services for real estate*
- *activities of real estate escrow agents*

4. AIR NAVIGATION SERVICES

5223 – Service activities incidental to air transportation (same as indicated in 3.1)

- *...airport and air-traffic-control activities*

5229 – Other transportation support activities

This class includes:

- *forwarding of freight*
- *arranging or organizing of transport operations by rail, road, sea or air*
- *organization of group and individual consignments (including pickup and delivery of goods and grouping of consignments)*
- *logistics activities, i.e. planning, designing and supporting operations of transportation, warehousing and distribution*
- *issue and procurement of transport documents and waybills*
- *activities of customs agents*
- *activities of sea-freight forwarders and air-cargo agents*
- *brokerage for ship and aircraft space*
- *goods-handling operations, e.g. temporary crating for the sole purpose of protecting the goods during transit, uncrating, sampling, weighing of goods*

This class excludes:

- *courier activities, see 5320*
- *provision of motor, marine, aviation and transport insurance, see 6512*
- *activities of travel agencies, see 7911*
- *activities of tour operators, see 7912*

- tourist assistance activities, see 7990

5. MAINTENANCE AND OVERHAUL

3313 – Repair of electronic and optical equipment

This class includes the repair and maintenance of goods produced in groups 265, 266 and 267, except those that are considered household goods.

This class includes repair and maintenance of the measuring, testing, navigating and control equipment of group 265, such as...

- ...aircraft engine instruments

3315 – Repair of transport equipment, except motor vehicles

This class includes the repair and maintenance of transport equipment of division 30, except motorcycles and bicycles. However, the factory rebuilding or overhaul of ships, locomotives, railroad cars and aircraft is classified in division 30.

This class includes...

- ...repair and maintenance of aircraft (except factory conversion, factory overhaul, factory rebuilding)
- ...repair and maintenance of aircraft engines

5223 – Service activities incidental to air transportation (same as indicated in 3.1)

This class includes activities related to air transport of passengers, animals or freight...

- ...operation of terminal facilities such as airway terminals, etc.
- ...airport and air-traffic-control activities
- ...ground service activities on airfields, etc.

This class also includes:

- firefighting and fire-prevention services at airports

6. REGULATORY FUNCTIONS

5229 – Other transportation support activities (same as indicated in 4)

This class includes...

... arranging or organizing of transport operations by rail, road, sea or air

...organization of group and individual consignments (including pickup and delivery of goods and grouping of consignments)

...logistics activities, i.e. planning, designing and supporting operations of transportation, warehousing and distribution

...issue and procurement of transport documents and waybills

...activities of customs agents

7120 – Technical testing and analysis

This class includes...

- ...certification of products, including consumer goods, motor vehicles, aircraft, pressurized containers, nuclear plants, etc.

8413 Regulation of and contribution to more efficient operation of businesses

This class includes:

—public administration and regulation, including subsidy allocation, for different economic sectors:

- agriculture*
- land use*
- energy and mining resources*
- infrastructure*
- transport*
- communication*
- hotels and tourism*
- wholesale and retail trade*

—administration of R&D policies and associated funds to improve economic performance

—administration of general labour affairs

—implementation of regional development policy measures, e.g. to reduce unemployment

7. AVIATION TRAINING

8522 – Technical and vocational secondary education

This class includes education typically emphasizing subject-matter specialization and instruction in both theoretical background and practical skills generally associated with present or prospective employment. The aim of a programme can vary from preparation for a general field of employment to a very specific job. Instruction may be provided in diverse settings, such as the unit's or client's training facilities, educational institutions, the workplace, or the home, and through correspondence, television, Internet, or other means.

This class includes:

- technical and vocational education below the level of higher education as defined in 853*

This class also includes:

- instruction for tourist guides*
- instruction for chefs, hoteliers and restaurateurs*
- special education for handicapped students at this level*
- cosmetology and barber schools*
- computer repair training*
- driving schools for occupational drivers e.g. of trucks, buses, coaches*

8530 – Higher education

This class includes the provision of post-secondary non-tertiary and tertiary education, including granting of degrees at baccalaureate, graduate or post-graduate level. The requirement for admission is at least a high school diploma or equivalent general academic training. Education can be provided in classrooms or through radio, television broadcast, Internet or correspondence.

This class includes:

- post-secondary non-tertiary education*
- first stage of tertiary education (not leading to an advanced research qualification)*
- second stage of tertiary education (leading to an advanced research qualification)*

This class also includes:

- *performing arts schools providing higher education*

8549 – Other education n.e.c.

This class includes the provision of instruction and specialized training, generally for adults, not comparable to the general education in groups 851–853. This class does not include activities of academic schools, colleges, and universities. Instruction may be provided in diverse settings, such as the unit's or client's training facilities, educational institutions, the workplace, or the home, and through correspondence, radio, television, Internet, in classrooms or by other means. Such instruction does not lead to a high school diploma, baccalaureate or graduate degree.

This class includes:

- *education that is not definable by level*
- *academic tutoring services*
- *college board preparation*
- *learning centres offering remedial courses*
- *professional examination review courses*
- *language instruction and conversational skills instruction*
- *speed reading instruction*
- *religious instruction*

8. OTHER ACTIVITIES

[Using this section for aviation-related classes that don't seem to fit elsewhere]

5210 – Warehousing and storage

This class includes operation of storage and warehouse facilities for all kinds of goods

5229 – Other transportation support activities

- *forwarding of freight*
- *arranging or organizing of transport operations by rail, road, sea or air*
- *organization of group and individual consignments (including pickup and delivery of goods and grouping of consignments)*
- *logistics activities, i.e. planning, designing and supporting operations of transportation, warehousing and distribution*
- *issue and procurement of transport documents and waybills*
- *activities of sea-freight forwarders and air-cargo agents*
- *brokerage for ship and aircraft space*

7730 – Renting and leasing of other machinery, equipment and tangible goods

This class includes...renting and operational leasing of air transport equipment without operator:

- *airplanes*
- *hot-air balloons*

81 – Services to buildings and landscape activities

This division includes the provision of a number of general support services, such as...

- ...cleaning of trains, buses, planes, etc.

8110 – Combined facilities support activities

This class includes:

- *provision of a combination of support services within a client's facility, such as general interior cleaning, maintenance, trash disposal, guard and security, mail routing, reception, laundry and related services to support operations within facilities*

Units classified here provide operating staff to carry out these support activities, but are not involved with or responsible for the core business or activities of the client.

8121 – General cleaning of buildings

This class includes:

—general (non-specialized) cleaning of all types of buildings, such as:

- *offices*
- *houses or apartments*
- *factories*
- *shops*
- *institutions*

—general (non-specialized) cleaning of other business and professional premises and multiunit residential buildings

8129 – Other building and industrial cleaning activities

This class includes:

- *...exterior cleaning of buildings of all types, including offices, factories, shops, institutions and other business and professional premises and multiunit residential buildings*
- *...cleaning of industrial machinery*
- *...cleaning of trains, buses, planes, etc.*
- *...disinfecting and exterminating activities*
- *...other building and industrial cleaning activities, n.e.c.*

8130 – Landscape care and maintenance service activities

This class includes...

- *...highway greenery (roads, train lines and tramlines, waterways, ports)*
- *...maintenance of land in order to keep it in good ecological condition*

Appendix 2

List of civil aviation characteristic products and mapping with CPC Ver. 2

1. Commercial air transport services
5110 - Passenger air transport
64134 – Sightseeing services by air
64241 – Domestic scheduled air transport services of passengers
64242 – Domestic non-scheduled air transport services of passengers
64243 – International scheduled air transport services of passengers
64244 – International non-scheduled air transport services of passengers
64250 – Space transport services of passengers
66031 – Rental services of passenger aircraft with operator
5120 - Freight air transport
65311 – Air transport services of letters and parcels
65319 – Air transport services of other freight
65320 – Space transport services of freight
66032 – Rental services of freight aircraft with operator
5310 - Postal activities
65311 – Air transport services of letters and parcels
5320 - Courier activities
65311 – Air transport services of letters and parcels
8690 - Other human health activities
93194 - Ambulance services
2. General aviation
0161 - Support activities for crop production
86119 – Other support services to crop production (incl. aerial spreading and spraying)
0162 - Support activities for animal production
86122 – Support services to farm animal husbandry
7420 - Photographic activities
83814 – Specialty photography services (incl. aerial photography)
8423 - Public order and safety activities
91260 – Police and fire protection services (incl. aerial police and air-sea rescue services)
7310 - Advertising
83619 – Other advertising services (incl. aerial advertising services)
4390 - Other specialized construction activities
N/A
7110 - Architectural and engineering activities and related technical consultancy
83322 – Engineering services for industrial and manufacturing projects
83323 – Engineering services for transportation projects

83421 – Surface surveying services

7120 - Technical testing and analysis

83443 – Testing and analysis services of integrated mechanical and electrical systems

8549 - Other education n.e.c.

92919 – Other education and training services n.e.c. (incl. flight training)

5110 - Passenger air transport

64134 – Sightseeing services by air

64250 – Space transport services of passengers

5120 - Freight air transport

65320 – Space transport services of freight

9319 - Other sports activities

96590 – Other sports and recreational sports services

7210 - Research and experimental development on natural sciences and engineering

81114 – Basic research services in engineering and technology

81124 – Applied research services in engineering and technology

81134 – Experimental development services in engineering and technology

3. Airport services

4922 - Other passenger land transport

64114 – Local special-purpose scheduled road transport services of passengers

64115 – Taxi services

64222 – Interurban special-purpose scheduled road transport services of passengers

5223 - Service activities incidental to air transportation

67610 – Airport operation services (excl. cargo handling)

67620 – Air traffic control services

67630 – Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)

67640 – Supporting services for space transport

5224 - Cargo handling

67110 – Container handling services

67190 – Other cargo and baggage handling services

6810 - Real estate activities with owned or leased property

72112 – Rental or leasing services involving owned or leased non-residential property

6820 - Real estate activities on a fee or contract basis

72212 – Non-residential property management services on a fee or contract basis

4. Air navigation services

5223 - Service activities incidental to air transportation

67620 – Air traffic control services

67640 – Supporting services for space transport

5229 - Other transportation support activities

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

5. Maintenance and overhaul

3313 - Repair of electronic and optical equipment

87154 – Maintenance and repair services of medical, precision and optical instruments

3315 - Repair of transport equipment, except motor vehicles

87149 – Maintenance and repair services of other transport equipment (incl. aircraft and aircraft engines)

5223 - Service activities incidental to air transportation

67630 – Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)

6. Regulatory functions

5229 - Other transportation support activities

679** – Other supporting transport services

67910 – Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

7120 - Technical testing and analysis

83449 – Other technical testing and analysis services

8413 - Regulation of and contribution to more efficient operation of businesses

91134 – Public administrative services related to transport and communications (incl. public administrative services related to air transport)

7. Aviation training

8522 - Technical and vocational secondary education

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

8530 - Higher education

92919 – Other education and training services n.e.c. (incl. flight training)

8549 - Other education n.e.c.

92919 – Other education and training services n.e.c. (incl. flight training)

8. Other activities

5210 - Warehousing and storage

67210 – Refrigerated storage services

67220 – Bulk liquid or gas storage services

67290 – Other storage and warehousing services

5229 - Other transportation support activities

67910 – Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

7730 - Renting and leasing of other machinery, equipment and tangible goods

73114 – Leasing or rental services concerning other land transport equipment without operator

73116 – Leasing or rental services concerning aircraft without operator

8110 - Combined facilities support activities

8121 - General cleaning of buildings

8129 - Other building and industrial cleaning activities

853** – Cleaning services

85310 – Disinfecting and exterminating services (incl. for aircraft)

85340 – Specialized cleaning services (incl. aircraft)

94510 – Sweeping and snow removal services (incl. runway cleaning and snow removal)

Explanatory notes

These explanatory notes refer exclusively to internationally comparable civil aviation characteristic products and follow the same order as in the table above.

They have been extracted from *Central Product Classification (CPC) Version 2.1*, United Nations, New York, 2015.

The complete document can be consulted at
<http://unstats.un.org/unsd/cr/registry/cpc-21.asp>

1. COMMERCIAL AIR TRANSPORT SERVICES

5110 - Passenger air transport

64134 – Sightseeing services by air

This subclass includes:

- *sightseeing passenger air transportation services*

64241 – Domestic scheduled air transport services of passengers

This subclass includes:

- *passenger transportation services by air on pre-determined domestic routes and on pre-determined schedules, in aircraft of any type, including helicopters*
- *transport of accompanying passenger baggage and other items that may be carried at no extra cost*

64242 – Domestic non-scheduled air transport services of passengers

This subclass includes:

- *passenger transportation services by air on domestic routes, on a non-scheduled basis, supplied in aircraft of any type, including helicopters*
- *transport of accompanying passenger baggage and other items that may be carried at no extra cost*

This subclass does not include:

- *sightseeing passenger air transport services, cf. 64134*
- *rental services of passenger aircraft with crew, cf. 66031*

64243 – International scheduled air transport services of passengers

This subclass includes:

- *passenger transportation services by air on pre-determined international routes and on predetermined schedules supplied in aircraft (including helicopters) of any type*
- *transportation of accompanying passenger baggage and other items that may be carried at no extra cost*

64244 – International non-scheduled air transport services of passengers

This subclass includes:

- *passenger transportation services by air on international routes, on a non-scheduled basis, supplied in aircraft of any type, including helicopters*
- *transportation of accompanying passenger baggage and other items that may be carried at no extra cost*

This subclass does not include:

- *sightseeing passenger air transport services, cf. 64134*
- *rental services of passenger aircraft with crew, cf. 66031*

64250 – Space transport services of passengers

This subclass includes:

- *transportation of passengers to, from and in outer space by any means*

66031 – Rental services of passenger aircraft with operator

This subclass includes:

- *rental services of passenger aircraft or aircraft suitable for passenger and freight (including helicopters) with crew*

5120 - Freight air transport

65311 – Air transport services of letters and parcels

This subclass includes:

- *transportation of letters and parcels by air, scheduled or non-scheduled, on behalf of postal and courier services*

65319 – Air transport services of other freight

This subclass includes:

- *air transportation of individual articles and packages assembled and shipped in specially constructed shipping containers designed for ease of handling in transport*
- *air transportation of freight not elsewhere classified*

65320 – Space transport services of freight

This subclass includes:

- *space transportation of freight*
- *launching and placing of satellites in space*

66032 – Rental services of freight aircraft with operator

This subclass includes:

- *rental services of freight-carrying aircraft (including helicopters) with crew*

5310 - Postal activities

5320 - Courier activities

8690 - Other human health activities

93194 - Ambulance services

This subclass includes:

- *services involving the transport of patients by ambulance, with or without resuscitation equipment or medical personnel*

2. GENERAL AVIATION

0161 - Support activities for crop production

86119 – Other support services to crop production (incl. aerial spreading and spraying)

This subclass includes:

- *tilling of fields preparatory to planting*
- *planting, cultivation and fertilization of crops*
- *spraying, including from the air*
- *pest control for agriculture*
- *trimming of fruit trees and vines*
- *transplanting and thinning of crops*
- *harvesting*
- *provision of agricultural machinery with crew and operators*
- *operation of irrigation systems for agricultural purposes*
- *other services necessary for agricultural production*

0162 – Support activities for animal production

86122 – Support services to farm animal husbandry

This subclass includes:

- *sheep shearing and care and management of herds of farm animals*
- *artificial insemination of farm animals*
- *grading of eggs*
- *cleaning of agricultural premises (hen houses, piggeries, etc.)*

7420 – Photographic activities

83814 – Specialty photography services (incl. aerial photography)

This subclass includes:

- *services consisting of photographing landscapes, structures and other surfaces from aircraft or helicopters*
- *services consisting of photographing persons, objects or scenery using special apparatus and techniques. Examples of such services are:*
 - *underwater photography*
 - *medical and biological photography*
 - *photomicrography*

8423 – Public order and safety activities

91260 – Police and fire protection services (aerial police and air-sea rescue services)

This subclass includes:

- *administrative and operational services provided by regular and auxiliary police forces, including harbour police, border police, coast guards and other special police forces*
- *police services related to traffic regulation, registration of aliens and maintenance of police records*
- *administrative and operational services related to firefighting and fire prevention by regular and auxiliary fire brigades*
- *marine fireboat services*
- *combatting of floods and other natural disasters*
- *beach surveillance and rescue operations on open water and in mountains*
- *civil protection services provided by army or police forces*

7310 – Advertising

83619 – Other advertising services (incl. aerial advertising services)

This subclass includes:

- *aerial advertising services*
- *delivery services of free samples and other advertising material*
- *demonstration and presentation advertising services at point of sale*
- *sales promotion (if no orders are received)*

4390 - Other specialized construction activities

N/A

7110 - Architectural and engineering activities and related technical consultancy

83322 – Engineering services for industrial and manufacturing projects

This subclass includes the application of physical laws and principles of engineering in the design, development and utilization of machines, materials, instruments, structures, processes and systems for industrial and manufacturing projects.

This subclass includes:

- *engineering services related to industrial facilities and processes:*
 - *mining and metallurgical facilities such as mines, smelters, mills, mineral refineries, including integrated facility and process engineering projects*
 - *mining and metallurgical processes, such as mineral extraction, smelting, refining, metal forming*
 - *petroleum and petrochemical facilities such as oil and gas platforms, refineries, petrochemical plants, including integrated facility and process engineering projects*
 - *processes for the production of petroleum and petrochemicals, such as extraction, refining, formulation, mixing*
 - *microelectronics facilities and processes, such as those that produce microprocessors, silicon chips and wafers, microcircuits, and semiconductors*
 - *textile and clothing facilities and processes*

- *iron and steel facilities and processes*
- *other industrial and manufacturing facilities and processes, n.e.c.*
- *engineering services related to the design of industrial and manufactured products, such as:*
 - *industrial machinery such as agricultural, construction, mining, metalworking, commercial and service industry, heating, ventilating and air-conditioning, power transmission machinery*
 - *electronic equipment such as computers and peripheral equipment, communications equipment, audio and video equipment, semiconductors and other electronic components*
 - *electrical equipment such as lighting, major and minor appliances and components thereof*
 - *transportation equipment such as motor vehicles, aircraft, trains, marine vessels, space vehicles*
 - *industrial and manufactured products not elsewhere classified*

83323 – Engineering services for transportation projects

This subclass includes the application of physical laws and principles of engineering in the design, development and utilization of machines, materials, instruments, structures, processes and systems for transportation infrastructure projects.

This subclass includes:

- *engineering services (including provision of designs, plans, and studies) related to:*
 - *highways, roads and streets, including elevated highways used for motor vehicle traffic*
 - *bridges and tunnels*
 - *ancillary road transport facilities such as rest stops, weigh stations, toll booths*
 - *mass transit systems, such as light rail or subway systems*
 - *railways and related structures*
 - *railway bridges and tunnels*
 - *marine and inland ports*
 - *harbours, locks, canals, and dams primarily used for transportation purposes*
 - *airports, runways, hangars*
 - *other aviation facilities*
 - *space transportation projects*
 - *oil and gas transportation projects*
 - *other transportation projects n.e.c.*

83421 – Surface surveying services

This subclass includes:

- *gathering of information on the shape, position and/or boundaries of a portion of the earth's surface by different methods, including transit, photogrammetric and hydrographic surveying, for the purpose of preparing maps*
- *collection of data by satellite*
- *land surveying services (e.g., marking of property, boundary marking)*

8549 - Other education n.e.c.

92919 – Other education and training services n.e.c. (incl. flight training)

This subclass includes:

- *training for car, bus, lorry and motorcycle driving licences*

- *training for flying certificates and ship licences*
- *computer training services*
- *management training services*
- *services provided by music camps, science camps, computer camps and other instructional camps, except for sports*
- *education services not definable by level*

5110 - Passenger air transport

64134 – Sightseeing services by air (same as previous)

64250 – Space transport services of passengers (same as previous)

5120 - Freight air transport

65320 – Space transport services of freight (same as previous)

9319 – Other sports activities

96590 -- Other sports and recreational sports services

This subclass includes:

- *skydiving services*
- *hang-gliding services*
- *scuba-diving services*

7120 - Technical testing and analysis

83443 – Testing and analysis services of integrated mechanical and electrical systems

This subclass includes:

- *testing and analysis of the mechanical and electrical characteristics of complete machinery, motors, automobiles, tools, appliances, communication equipment and other equipment incorporating mechanical and electrical components. The results of the testing and analysis generally take the form of an assessment of the performance and behavioural characteristics of the object tested. Tests may be performed using models or mock-ups of ships, aircraft, dams, etc.*

7210 - Research and experimental development on natural sciences and engineering

81114 – Basic research services in engineering and technology

This subclass includes:

- *basic research services related to science and technology for casting, metal, machinery, electricity, communications, vessels, aircraft, civil engineering, construction, information, etc.*

81124 – Applied research services in engineering and technology

This subclass includes:

- *applied research services related to science and technology for casting, metal, machinery, electricity, communications, vessels, aircraft, civil engineering, construction, information, etc.*

81134 – Experimental development services in engineering and technology

This subclass includes:

- *experimental development services related to science and technology for casting, metal, machinery, electricity, communications, vessels, aircraft, civil engineering, construction, information, etc.*

3. AIRPORT SERVICES

4922 - Other passenger land transport

64114 - Local special-purpose scheduled road transport services of passengers

This subclass includes:

- *passenger transportation services over pre-determined routes on a pre-determined schedule within the confines of a single city or group of contiguous cities, for a specific segment of users, e.g., colleges or enterprises*
- *scheduled urban and suburban shuttle services, e.g., airport shuttles*
- *transportation services of pupils by school bus between their homes and school and between schools, including in rural areas*

This subclass does not include:

- *urban and suburban scheduled passenger transportation services available to all users, cf. 64112*
- *taxi services, cf. 64115*
- *non-scheduled airport shuttle services, cf. 64115*
- *chauffeur-driven hire car services, cf. 64116*
- *sightseeing road transportation, e.g., sightseeing-bus services, cf. 64132*

64115 - Taxi services

This subclass includes:

- *passenger transportation services by motorized taxi within or between urban and suburban areas*
- *non-scheduled airport shuttle services*

This subclass does not include:

- *scheduled airport shuttle services, cf. 64114*
- *chauffeur-driven car-hire services, cf. 64116*
- *man or animal-drawn taxi services, cf. 64117*
- *water taxi services, cf. 64129*
- *air taxi services, cf. 64242*
- *ambulance services, cf. 93194*

64222 - Interurban special-purpose scheduled road transport services of passengers

This subclass includes:

- *passenger transportation services between non-contiguous cities over predetermined routes on a predetermined schedule by motor bus, tramway, trolley bus and similar, for a specific segment of users*
- *scheduled interurban shuttle services, e.g., airport shuttles*

5223 - Service activities incidental to air transportation

67610 – Airport operation services (excl. cargo handling)

This subclass includes:

- *passenger air terminal services and ground services on air fields, including runway operating services*

This subclass does not include:

- *air terminal cargo-handling services:*
 - *for containerized freight, cf. 67110*
 - *for non-containerized freight or for passenger baggage, cf. 67190*
- *runway cleaning and snow removal services, cf. 94510*

67620 – Air traffic control services

This subclass includes:

- *flight control tower operation services, including approach, landing and take-off control services*
- *services provided by airport-located radar stations*

67630 - Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)

This subclass includes:

- *other supporting services for air transport, such as:*
 - *aircraft firefighting and fire prevention services*
 - *aircraft maintenance and upkeep services (excluding repairs)*
 - *hangar services*
 - *aircraft towing*

67640 - Supporting services for space transport

This subclass includes:

- *specialized support services for space transportation*

5224 - Cargo handling

67110 – Container handling services

This subclass includes:

- *cargo handling services for containerized freight*
- *services of container freight terminal facilities for all modes of transport, including stevedoring services (i.e. loading, unloading and discharging of vessels' containerized freight, at ports)*

67190 – Other cargo and baggage handling services

This subclass includes:

- *cargo handling services for non-containerized freight*
- *services of freight terminal facilities, for all modes of transport, including stevedoring services (i.e. loading, unloading and discharging of vessels' non-containerized freight, at ports)*
- *cargo handling services incidental to freight transport not elsewhere classified*

- *baggage handling services at airports and at bus, rail or highway vehicle terminals*

6810 - Real estate activities with owned or leased property

72112 – Rental or leasing services involving owned or leased non-residential property

This subclass includes:

- *rental or leasing services concerning industrial, commercial or other non-residential buildings or property by owners or leaseholders, such as:*
 - *factories, office buildings, warehouses*
 - *theatres, convention centres, exhibition halls and multiple-use buildings that are primarily non residential*
 - *agricultural, forestry and similar properties*
- *rental or leasing of caravan sites, lock-up garages or other places for parking vehicles, by the month or year*

6820 - Real estate activities on a fee or contract basis

72212 – Non-residential property management services on a fee or contract basis

This subclass includes:

- *management services concerning industrial and commercial properties, multiple-use buildings that are primarily non-residential, etc.*
- *management services concerning agricultural, forestry and similar properties*

This subclass does not include:

- *sports and recreational sports facility operation services, cf. 96520*
- *operation of other recreation and amusement service facilities n.e.c., cf. 96990*

4. AIR NAVIGATION SERVICES

5223 - Service activities incidental to air transportation

67620 – Air traffic control services

This subclass includes:

- *flight control tower operation services, including approach, landing and take-off control services*
- *services provided by airport-located radar stations*

67640 – Supporting services for space transport (same as above)

5229 - Other transportation support activities

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

This subclass includes:

- *type rating services (aircraft-specific permits for flying a particular type of plane)*
- *liquefaction and regasification of natural gas for transportation*
- *radio navigational aid locating services, such as GPS (global positioning system) provision*

5. MAINTENANCE AND OVERHAUL

3313 - Repair of electronic and optical equipment

87154 – Maintenance and repair services of medical, precision and optical instruments

This subclass includes:

- maintenance and repair services of:

- *irradiation, electromedical and electrotherapeutic equipment such as magnetic resonance imaging equipment, medical ultrasound equipment, pacemakers, hearing aids, electrocardiographs, electromedical endoscopic equipment, irradiation apparatus*
- *orthopedic and prosthetic devices*
- *instruments and apparatus for measuring, checking, testing and navigating and other purposes such as aircraft engine instruments, automotive emissions testing equipment, meteorological instruments, physical, electrical and chemical properties testing and inspection equipment, surveying instruments, radiation detection and monitoring instruments*
- *professional photographic, cinematographic and optical instruments*

3315 - Repair of transport equipment, except motor vehicles

87149 – Maintenance and repair services of other transport equipment (incl. aircraft and aircraft engines)

This subclass includes:

- maintenance and repair services of:

- *ships and floating platforms and structures*
- *pleasure and sporting boats*
- *railway and tramway locomotives and rolling stock*
- *aircraft and aircraft engines*

5223 - Service activities incidental to air transportation

67630 – Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)

This subclass includes:

- other supporting services for air transport, such as:

- *aircraft firefighting and fire prevention services*
- *aircraft maintenance and upkeep services (excluding repairs)*
- *hangar services*
- *aircraft towing*

6. REGULATORY FUNCTIONS

5229 - Other transportation support activities

679 – Other supporting transport services

67910 – Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)

This subclass includes:

- *ship brokerage services*
- *freight brokerage services*
- *freight forwarding services (primarily transport organization or arrangement services on behalf of the shipper or consignee)*
- *aircraft space brokerage services*
- *freight consolidation and break-bulk services*

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

This subclass includes:

- *type rating services (aircraft-specific permits for flying a particular type of plane)*
- *liquefaction and regasification of natural gas for transportation*
- *radio navigational aid locating services, such as GPS (global positioning system) provision*

7120 - Technical testing and analysis

83449 - Other technical testing and analysis services

This subclass includes:

- *testing and analysis of a technical or scientific nature that does not alter the object being tested*
- *radiographic, magnetic, and ultrasonic testing of machine parts and structures in order to identify defects. These tests are often conducted on site.*
- *certification of ships, aircraft, dams, etc.*
- *certification and authentication of works of art*
- *radiological inspection of welds*
- *all other technical testing and analysis services not elsewhere classified*

8413 - Regulation of and contribution to more efficient operation of businesses

91134 – Public administrative services related to transport and communications (incl. public administrative services related to air transport)

This subclass includes:

- *public administrative services related to road and water transport, railway and air transport and communications*
- *administrative services provided by government offices, bureaux and programme units concerning:*
 - *planning, design, construction, maintenance and improvement of:*
 - *roads, highways and associated structures*
 - *roadbeds and associated structures*
 - *water transport facilities; railways; airport runways, terminals, hangars, air navigation aids; other fixed structures and equipment associated with air transport*
 - *pipelines and other facilities*

- *supervision and regulation of such work and development and administration of operational regulations for all the above-mentioned means of transport and related equipment*
- *public administrative services related to communications, i.e. postal, telephone, telegraph, cable and wireless communications systems and communications satellites*
- *public administrative services related to planning, development, functioning and improvement of communications systems*
- *public administrative services related to the development and administration of regulations for these systems*
- *support and information services for the above-mentioned affairs*

7. AVIATION TRAINING

8522 - Technical and vocational secondary education

67990 - Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

This subclass includes:

- *type rating services (aircraft-specific permits for flying a particular type of plane)*
- *liquefaction and regasification of natural gas for transportation*
- *radio navigational aid locating services, such as GPS (global positioning system) provision*

8530 - Higher education

N/A

8549 - Other education n.e.c.

92919 - Other education and training services n.e.c. (incl. flight training)

This subclass includes:

- *training for car, bus, lorry and motorcycle driving licences*
- *training for flying certificates and ship licences*
- *computer training services*
- *management training services*
- *services provided by music camps, science camps, computer camps and other instructional camps,*
- *except for sports*
- *education services not definable by level*

8. OTHER ACTIVITIES

5210 - Warehousing and storage

67210 - Refrigerated storage services

This subclass includes:

- *storage and warehousing services for frozen or refrigerated goods, including perishable food products*
- *blast freezing services, associated with storage and warehousing*

67220 - Bulk liquid or gas storage services

This subclass includes:

- *bulk storage and warehousing services for liquids and gases, including oil and oil products, wine and the like*

67290 - Other storage and warehousing services

This subclass includes:

- *storage services of grains*
- *other storage or warehousing services*

5229 - Other transportation support activities

67910 – Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)

This subclass includes:

- *ship brokerage services*
- *freight brokerage services*
- *freight forwarding services (primarily transport organization or arrangement services on behalf of the shipper or consignee)*
- *aircraft space brokerage services*
- *freight consolidation and break-bulk services*

67990 – Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)

This subclass includes:

- *type rating services (aircraft-specific permits for flying a particular type of plane)*
- *liquefaction and regasification of natural gas for transportation*
- *radio navigational aid locating services, such as GPS (global positioning system) provision*

7730 - Renting and leasing of other machinery, equipment and tangible goods

73114 – Leasing or rental services concerning other land transport equipment without operator

This subclass includes:

- *leasing, rental or hiring services concerning motorcycles, caravans and campers without driver*
- *leasing, rental or hiring services concerning other public-transport-type passenger vehicles such as buses, without driver*
- *leasing, rental or hiring services concerning other land transport equipment without operator*
- *rental services of man- or animal-drawn passenger vehicles without driver*

73116 – Leasing or rental services concerning aircraft without operator

This subclass includes:

- *leasing, rental or hiring services concerning aircraft (e.g., helicopters, aeroplanes) without operators*

8110 - Combined facilities support activities

8121 - General cleaning of buildings

8129 - Other building and industrial cleaning activities

853 – Cleaning services**

85310 – Disinfecting and exterminating services (incl. for aircraft)

This subclass includes:

- *disinfecting dwellings and other buildings*
- *disinfecting vehicles, e.g., buses, trains, boats, planes*
- *exterminating insects, rodents and other pests*
- *fumigation services and pest control services*

85340 – Specialized cleaning services (incl. aircraft)

This subclass includes:

- *cleaning of computer rooms and the like*
- *specialized cleaning services for reservoirs and tanks, these being parts of either industrial sites or transport equipment*
- *sterilization of objects or premises (operating rooms)*
- *furnace and chimney cleaning services*
- *exterior cleaning of buildings of all types*
- *cleaning of fireplaces, stoves, furnaces, incinerators, boilers, ventilation ducts and exhaust units*
- *cleaning of transportation equipment*

94510 – Sweeping and snow removal services (incl. runway cleaning and snow removal)

This subclass includes:

- *street sweeping and cleaning services*
- *gritting and salting of roads*
- *snow ploughing and removal*
- *runway sweeping and snow removal services*
- *runway vacuuming services*

Appendix 3

List of civil aviation characteristic and connected products and grouping by main categories according to CPC Ver. 2

CPC Section	CPC Code	CPC Name	Characteristic/Connected
1. Ores and minerals; electricity, gas and water	17100	Electrical energy	Connected
	17200	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons	Connected
	1****	Other ores and minerals; electricity, gas and water n.e.c.	Connected
2. Food products, beverages and tobacco; textiles, apparel and leather products	27***	Textile articles other than apparel	Connected
	2717*	Parachutes	Connected
	29***	Leather and leather products; footwear	Connected
3. Other transportable goods, except metal products, machinery and equipment	333**	Petroleum oils and oils obtained from bituminous materials, other than crude; preparations n.e.c. containing by weight 70% or more of these oils, such oils being the basic constituents of the preparations	Connected
	33312	Aviation gasoline	Connected
	33320	Gasoline-type jet fuel	Connected
	33342	Kerosene-type jet fuel	Connected
	3****	Other transportable goods, except metal products, machinery and equipment n.e.c.	Connected
4. Metal products, machinery and equipment	49221	Containers specially designed and equipped for carriage by one or more modes of transport	Connected
	49540	Parts of railway or tramway locomotives or rolling stock; railway or tramway track fixtures and fittings, and parts thereof; mechanical (including electromechanical) signalling, safety or traffic control equipment for railways, tramways, roads, inland waterways, parking facilities, port installations or airfields, and parts thereof	Connected
	49610	Balloons and dirigibles: gliders, hang gliders and other non-powered aircraft	Connected
	49621	Helicopters	Connected
	49622	Aeroplanes and other powered aircraft of an unladen weight not exceeding 2000kg	Connected
	49623	Aeroplanes and other powered aircraft of an unladen weight exceeding 2000kg	Connected
	49630	Spacecraft and spacecraft launch vehicles	Connected
	49640	Parts of aircraft and spacecraft	Connected
	4****	Other metal products, machinery and equipment	Connected
	531**	Buildings	Connected
5. Constructions and construction services	53122	Commercial buildings (incl. air transport terminals and parking garages)	Connected
	532**	Civil engineering works	Connected

	53213	Airfield runways	Connected
	53290	Other civil engineering works (incl. satellite launching sites)	Connected
	5412*	General construction services of non-residential buildings	Connected
	54122	General construction services of commercial buildings	Connected
	54211	General construction services of highways (except elevated highways), streets and roads (incl. parking)	Connected
	54213	General construction services of airfield runways	Connected
	54290	General construction services of other civil engineering works (incl. satellite launching sites)	Connected
	54619	Other electrical installation services	Connected
	5****	Other construction n.e.c.	Connected
	63***	Accommodation, food and beverage services	Connected
	6224	Air transport services of passengers	Connected
	631**	Accommodation services for visitors	Connected
	632**	Other accommodation services for visitors and others	Connected
	633**	Food serving services	Connected
	63392	Contract food services for transportation operators	Connected
	63400	Beverage serving services	Connected
	641	Local transport and sightseeing transportation	Connected
	64114	Scheduled airport shuttle services (part)	Characteristic
	64115	Non-scheduled airport shuttle services (part)	Characteristic
	64134	Sightseeing services by air	Characteristic
	64222	Interurban special-purpose scheduled road transport services of passengers	Characteristic
	64241	Domestic scheduled air transport services of passengers	Characteristic
	64242	Domestic non-scheduled air transport services of passengers	Characteristic
	64243	International scheduled air transport services of passengers	Characteristic
	64244	International non-scheduled air transport services of passengers	Characteristic
	64250	Space transport services of passengers	Characteristic
	65112	Road transport services of freight by tank trucks or semi-trailers (part - jet A1, avgas??)	Connected
	65131	Transport services via pipeline of petroleum and natural gas (part)	Connected
	65311	Air transport services of letters and parcels	Characteristic
	65319	Air transport services of other freight	Characteristic
	65320	Space transport services of freight	Characteristic
	66031	Rental services of passenger aircraft with operator	Characteristic
	66032	Rental services of freight aircraft with operator	Characteristic
	67110	Container handling services (part)	Characteristic
	67190	Other cargo and baggage handling services (part)	Characteristic
	6721	Refrigerated storage services	Connected
	6722	Bulk liquid or gas storage services	Connected
	6729	Other storage and warehousing services	Connected
	67430	Parking lot services (part)	Connected
	67610	Airport operation services (excl. cargo handling)	Characteristic
	67620	Air traffic control services	Characteristic
6. Distributive trade services; accommodation, food and beverage serving services; transport services; and electricity, gas and water distribution services			

	67630	Other supporting services for air transport (incl. aircraft firefighting and fire prevention, aircraft maintenance, hangar services, aircraft towing)	Characteristic
	67640	Supporting services for space transport	Characteristic
	67910	Freight transport agency services and other freight transport services (incl. aircraft space brokerage services)	Characteristic
	67990	Other supporting transport services n.e.c. (incl. type rating services for aircraft and radio navigational aid services)	Characteristic
	6911*	Electricity transmission and distribution (on own account)	Connected
	69210	Water distribution through mains, except steam and hot water (on own account)	Connected
	69220	Distribution of steam, hot water and air-conditioning supply through mains (on own account)	Connected
	6****	Other distributive trades services n.e.c.	Connected
7. Financial and related services; real estate services; and rental and leasing services	71***	Financial and related services	Connected
	71140	Financial leasing services	Connected
	71200	Investment banking services	Connected
	71334	Other property insurance services	Connected
	71335	General liability insurance services	Connected
	71337	Travel insurance services	Connected
	71432	Marine, aviation and other transport reinsurance services	Connected
	721**	Real estate services involving owned or leased property	Characteristic
	72112	Rental or leasing services involving owned or leased non-residential property	Characteristic
	722**	Real estate services on a fee or contract basis	Characteristic
	72212	Non-residential property management services on a fee or contract basis	Characteristic
	73114	Leasing or rental services concerning other land transport equipment without operator	Characteristic
	73116	Leasing or rental services concerning aircraft without operator	Characteristic
	7****	Other financial and related services n.e.c.	Connected
	81***	Research and development services	Characteristic
	8. Business and production services	81114	Basic research services in engineering and technology
81124		Applied research services in engineering and technology	Characteristic
81134		Experimental development services in engineering and technology	Characteristic
82***		Legal and accounting services	Connected
83***		Professional, technical and business services (except research, development, legal and accounting services)	Characteristic
83322		Engineering services for industrial and manufacturing projects	Characteristic
83323		Engineering services for transportation projects	Characteristic
83421		Surface surveying services	Characteristic
83443		Testing and analysis services of integrated mechanical and electrical systems	Characteristic
83449		Other technical testing and analysis services	Characteristic
8361*		Advertising services	Characteristic
83619	Other advertising services (incl. aerial advertising services)	Characteristic	

	83814	Specialty photography services (incl. aerial photography)	Characteristic
	84***	Telecommunications, broadcasting and information supply services	Connected
	84420	News agency services to audiovisual media	Connected
	853**	Cleaning services	Characteristic
	85310	Disinfecting and exterminating services (incl. for aircraft)	Characteristic
	85340	Specialized cleaning services (incl. aircraft)	Characteristic
	85511	Reservation services for air transportation	Connected
	85519	Other transportation arrangement and reservation services n.e.c.	Connected
	85540	Tour operator services	Connected
	8594*	Combined office administrative services	Connected
	85954	Document preparation and other specialized office support services	Connected
	86119	Other support services to crop production (incl. aerial spreading and spraying)	Characteristic
	86122	Support services to farm animal husbandry (incl. aerial mustering - assumed)	Characteristic
	86132	Support services to hunting (incl. aerial culling of wildlife)	Connected
	87***	Maintenance, repair and installation (except construction) services	Characteristic
	87149	Maintenance and repair services of other transport equipment (incl. aircraft and aircraft engines)	Characteristic
	87152	Maintenance and repair services of electrical machinery and apparatus n.e.c. (incl. aerial powerline inspection services - assumed)	Connected
	87154	Maintenance and repair services of medical, precision and optical instruments	Characteristic
	88824	Air and spacecraft manufacturing services performed on physical inputs owned by units other than the units providing the service.	Connected
	8****	Other business services n.e.c.	Characteristic
9. Community, social and personal services	91134	Public administrative services related to transport and communications (incl. public administrative services related to air transport)	Characteristic
	91260	Police and fire protection services (incl. aerial police and air-sea rescue services)	Characteristic
	92919	Other education and training services n.e.c. (incl. flight training)	Characteristic
	93194	Ambulance services	Characteristic
	94***	Sewage and waste collection, treatment and disposal and other environmental protection services	Characteristic
	94510	Sweeping and snow removal services (incl. runway cleaning and snow removal)	Characteristic
	95120	Services furnished by professional organizations	Connected
	95997	Cultural and recreational associations (other than sports or games)	Connected
	96590	Other sports and recreational sports services (incl. skydiving services, hang-gliding services)	Characteristic
	9****	Other community, social and personal services n.e.c.	Characteristic

