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Strategic Freight Model 2022 (SFM22)

# Data dictionary

This data dictionary provides a high-level overview of data attributes of the SFM22 and the associated Excel flat file. These attributes are described in terms of what the freight commodity is used for (that is, the end use), nature of the supply chain between origins and destinations. A small sample of the structure of the Excel flat file is displayed at the back of this document.

## Introduction and overview

SFM22 contains road and rail freight origin-destination movement tonnages for 20 commodity groups transported within and through NSW. The dataset contains base year (2018) and forecast movement tonnages in 5-year intervals from 2021 to 2061.

## Document purpose

This document describes the data attributes available in the SFM22 dataset and the associated Excel flat file. These attributes are described in terms of what the freight commodity is used for (that is, the end use) and nature of the supply chain between origins and destinations.

SFM22 presents the base case, business as usual (BAU) projections of the future unconstrained freight tasks. These forecasts are used to set the overall growth rates for each commodity which is then applied to the respective supply chains for each commodity, this movement dataset is then used in network modelling and assessment of the freight task.

## Document scope

This document focuses purely on the definitions of data attributes included in the SFM22 and associated Excel flat file. The structure, data relationships, drivers and definitions of all data attributes in the SFM22 can be found in the NSW Freight Commodity Demand Forecasts report (to be published in July 2025).

The forecasts in this dataset are generated off base year estimates for commodity demand in 2018. All 2018 numbers in this dataset are estimates of actual demand. The first forecast year is 2021 and the last forecast year is 2061. This means forecasts are prepared over a 40-year period.

The freight demand forecasts in this dataset have been compiled by the Transport Modelling team within the Planning, Integration and Passenger division.

The forecasts are based on a mix of methods and sources including:

* Time-series econometric modelling and statistical analysis;
* Extrapolations of long run historical growth trends with adjustments for current and likely changes (used to forecast most agricultural commodities);
* Economic, industry, and company-specific literature review, research and analysis;
* NSW macroeconomic forecasts (NSW 2021 Intergenerational Report), NSW population, housing and employment forecasts (Travel Zone Projections 2022);
* Structural policy assumptions/aspirations and market changes (i.e. rising electric vehicle sales will lower the fuel freight task, move to renewable energy sources will lower coal freight task);
* Industry competitiveness assumptions and judgements (used to forecast container imports and local production of manufactures);
* Departmental forecast assumptions (i.e. future infrastructure construction project list);
* Large project Environmental Impact Studies (i.e. Western Sydney airport EIS); and
* Departmental freight documents (i.e. 2018-23 Freight and Ports Plan regarding container spillover from Port Botany assumptions)

## Audience

The intended audience of this document includes those who are responsible for developing data visualisations and reports on SFM22 dataset for ongoing analysis, and those who wish to use SFM22 as input into strategic business cases and cost benefit analysis for road, rail, intermodal and port freight infrastructure projects.

## Data dictionary

## The commodity data attributes available in the SFM22 are summarised below.

|  |  |  |
| --- | --- | --- |
| Commodity group | End user demand | Origin-destination supply chain |
| Aluminium | Exported to Asian countries for input into a range of manufactured commodities | Moved from aluminium smelters to container export ports by rail |
| Coal | Mostly exported to Asian countries for electricity generation and steel manufacturing purposes. Some coal destined for domestic electricity generators (power stations) and domestic steel manufacturing | Moved mostly by rail from mines to export ports, domestic power stations and domestic steel manufacturers |
| Construction materials | Aggregates and sand, bitumen, cement, concrete, bricks, plasterboard and fly ash used to construct in domestic dwelling (houses, apartments), non-dwellings (office, retail, industrial, other) and infrastructure (road and rail) construction | Moved mostly by road from quarries, concrete batching plants and various other types of manufacturing facilities to distribution centres and construction sites |
| Consumer products | Domestically produced food and non-food items for domestic household consumption | Moved by road from distribution centres to supermarkets and bulky good retailer stores |
| Containers (import and export) | Most import containers are inputs into domestic manufacturing (machinery and equipment imports) or consumer products (whitegoods, TVs, computers, furniture) for household consumption  Most export containers are agricultural or manufactured goods. | Import containers from container port are moved mainly by road to manufacturers and distribution centres for unpacking  Export containers are moved by a mix of road and rail to container export port |
| Cotton | Cotton lint exported for textile manufacturing purposes | Moved by road from farms to cotton gins. Moved mostly by rail from cotton gins to container export port |
| Dairy | Milk, cheese and other dairy products mostly for domestic household consumption | Moved by road from farms to processor facilities, distribution centre and supermarket locations |
| Forestry | Logs, timber and particleboard primarily for domestic construction purposes, paper is exported | Moved mostly by road from forests to sawmills, distribution centres, retailers and container export ports |
| Fuel | Petrol and diesel imported for household and industry uses (manufacturing, construction, freight transport, agricultural and mining users). AvGas imported for aviation purposes | Petrol and diesel moved via pipelines connecting import terminals to large distribution depots, moved by fuel tankers from large distribution depots to large number of petrol service stations  AvGas moved via pipelines connecting import terminals and Kingsford Smith Airport, with some temporary road-based distribution to new Western Sydney Airport |
| Grain | Wheat, barley, oats, pulses and sorghum used in domestic flour milling, alcohol manufacturing, food and starch products manufacturing, livestock feedlot and export purposes | Moved by road from farms to silos initially. Moved by road and rail to domestic millers, manufacturers and feedlots, as well as bulk and container export ports |
| Grapes and wine | Grapes are crushed at processor facilities to make wine | Grapes moved by road from farms to wine processor facilities.  Wine mostly moved by rail from wine processor facilities to export container port |
| Horticulture | Fresh fruit and vegetables mostly for domestic household consumption, with some export | Moved by road from farms to central markets, distribution centres and supermarkets |
| Livestock | Cattle, sheep, pigs and chicken used in meat production | Moved by road from farms to feedlots, saleyards and abattoirs |
| Manufactures | ManufacturesC1 (Food products) | Mostly moved by road from manufacturing facilities to distribution centres and downstream manufacturing facilities |
| ManufacturesC2 (Beverage and Tobacco Product) |
| ManufacturesC3 (Textile, Leather, Clothing and Footwear) |
| ManufacturesC4 (Wood Product) |
| ManufacturesC5 (Pulp, Paper and Converted Paper Product) |
| ManufacturesC6 (Printing (including the Reproduction of Recorded Media) |
| ManufacturesC7 (Petroleum and Coal Product) |
| ManufacturesC8 (Basic Chemical and Chemical Product) |
| ManufacturesC9 (Polymer Product and Rubber Product) |
| ManufacturesC10 (Non-Metallic Mineral Product) |
| ManufacturesC11 (Primary Metal and Metal Product) |
| ManufacturesC12 (Fabricated Metal Product) |
| ManufacturesC13 (Transport Equipment) |
| ManufacturesC14 (Machinery and Equipment) |
| ManufacturesC15 (Furniture and Other) |
| Meat | Beef, sheep, port and chicken meat for domestic household consumption and export purposes | Moved mostly by road from abattoirs to distribution centres and supermarkets for domestic household consumption  Moved by road and rail to container export ports |
| Motor vehicles | Passenger cars, SUVs, Light Commercial Vehicles, trucks and buses for household, business and public transport uses | Moved by road from import terminal to large storage yards, distributed thereafter to sales dealerships |
| Non coal minerals | Zinc, lead, rutile, copper, mineral sands, gold and silver concentrates mostly for export purposes | Moved by road and rail from mine sites to bulk export ports |
| Oilseeds | Canola seed and cotton seed used to manufacture edible oil and livestock meals, export | Seed is mostly moved by road from farms to manufacturers  Seed is mostly railed to export bulk and container ports |
| Steel | Mostly used in domestic construction (dwellings, non-dwelling and infrastructure) and mining | Moved by road and rail from steel manufacturing facilities to distribution centres and construction sites |
| Waste | Municipal Solid Waste (MSW) generated by households, Commercial and Industrial (C&I) waste generated by commercial businesses, Construction and Demolition (C&D) waste generated by the construction sector | Moved by road from transfer stations to recycling facilities, composting facilities, landfill and terminals  Some railed from terminals to landfill |

## Data structure

The table below lists the field name of each column in the SFM22 excel flat file and describes the contents and rationale of each field.

|  |  |
| --- | --- |
| Field name | Field description |
| ID\_prime | A cumulative row count across the flatfile (30000 rows). It is useful in that it provides an overall guide on the total size of the file and a cross-check on the number of rows that are pasted in from the individual commodity forecast sheets. The sum of the row entries from the individual commodity forecast sheets should equal the last row number in this column. |
| Sheet | The name of the internal working commodity forecast sheet. |
| Entry | The number of row entries in each commodity forecast sheet. For example, the quarry commodity has 367 row entries, the fuel commodity has 818 row entries and so on. It acts like a serial for a unique commodity origin-destination forecast. It is particularly useful for when a user would like to focus on forecasts for an individual commodity (i.e. filtering the highest/lowest values for a commodity, finding the main origins and destinations for a commodity). |
| MODE | The mode is either road or rail. A commodity is moved between an origin and destination using road transport (a truck) or rail transport (a freight train). |
| TYPE\_ORIGIN | The type of facility where the commodity originates. For example, a commodity can originate at a grain silo, distribution centre, manufacturer, quarry, fuel terminal, farm and so on. This provides the user with a practical real-world description of the origin point. It helps visualise what the origin-destination supply chain looks like for each commodity. |
| SA3\_CODE\_O | A commodity originates in an SA3, where SA3 (Statistical Area Level 3) is the geographic classification area used in the SFM. The SA3 origin code is a 5-digit code in NSW or interstate. The codes come directly from the Australian Bureau of Statistics' (ABS) Australian Statistical Geography Standard. |
| SA3\_NAME\_O | The SA3 name corresponding to the above SA3 code (SA3\_CODE\_O) |
| TYPE\_DESTINATION | The type of facility where the commodity is destined. For example, a commodity can originate at a grain silo, distribution centre, manufacturer, quarry, fuel terminal, farm and so on. This provides the user with a practical real-world description of the origin point. It helps visualise what the origin-destination supply chain looks like for each commodity. |
| SA3\_CODE\_ D | A commodity is destined for an SA3, where SA3 (Statistical Area Level 3) is the geographic classification area used in the SFM. The SA3 destination code is a 5-digit code in NSW or interstate. The codes come directly from the Australian Bureau of Statistics' (ABS) Australian Statistical Geography Standard. |
| SA3\_CODE\_D\_NEW | The above 5-digit SA3 destination codes are translated in instances where 5-digit interstate SA3 destination codes are available. For a small number of commodities, 5-digit interstate SA3 destination codes are available. These 5-digit interstate codes need to be converted to single-digit interstate codes. For example, some aggregates and sand from NSW is destined for 20403, which is the 5-digit code for the Wodonga-Alpine SA3. This SA3 is located in Victoria. Since Victoria has a single-digit code of 2 the flat file translates "20403" to "2". A further example is grain. Some grain from NSW is destined for Port of Brisbane for export. It is destined for 30103, which is the 5-digit code for the Wynnum-Manly SA3 (Port of Brisbane falls within this SA3). This SA3 is located in Queensland. Since Queensland has a single-digit code of 3 the flat file translates "30103" to "3". This process ensures all interstate destinations are denoted by single-digit codes across all commodity movements. But the flat file does provide the user with the opportunity to drill down to the 5-digit interstate SA3 destination level for locational granularity purposes. That is, the user can find the specific interstate location for those commodities where it is available. |
| SA3\_NAME\_D | The SA3 name corresponding to the above SA3 code (SA3\_CODE\_D\_NEW) |
| SA3\_NAME\_D\_New | The above SA3 destination names are translated in instances where interstate SA3 destination names are available. For a small number of commodities, interstate SA3 destination names are available. These interstate SA3 names need to be converted to the generic interstate name. Using the same examples outlined in column J, the "Wodonga-Alpine" SA3 name is translated to "VIC". Similarly, the "Wynnum-Manly" SA3 name is translated to "QLD". This process ensures all interstate destinations are denoted by their generic interstate name across all commodity movements. But the flat file does provide the user with the opportunity to obtain the specific interstate SA3 name where it is available. |
| SA3OD | The name of the SA3 origin and destination for a particular commodity movement. It is a combination of "SA3\_NAME\_O" and "SA3\_NAME\_D\_NEW". |
| COMMODITY\_GROUP | The name for the broad or general commodity group. For example, "Construction Materials" captures the different types of construction materials. "Consumer Products" includes the different types of commodities consumed by households (food and non-food). |
| SUB\_COMMODITY | The specific names of commodities falling under the "Commodity Group". For example, aggregates and sand, cement, concrete, bricks, bitumen, fly ash, plasterboard is the name of the sub commodities falling under the Construction Materials commodity group. Similarly, food and non-food is the name of the sub commodities falling under the Consumer Goods commodity group. |

## Sample data

A small sample of the data structure in the SFM22 Excel flat file is shown below.



