National Freight Data Hub: Response to the Discussion Paper #1

CENTRE FOR SUPPLY CHAIN AND LOGISTICS

PREPARED FOR THE DEPARTMENT OF INFRASTRUCTURE, TRANSPORT, CITIES AND REGIONAL DEVELOPMENT

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CSCL’s activities are built on three pillars: innovative and rigorous applied research; industry engagement throughout Australia, Asia and the Pacific region; and capability building through the provision of practical education programs, including Doctoral and other postgraduate programs.

All CSCL’s activities are underpinned by the diverse and extensive expertise of its people and partners, including extensive operational, strategic and academic experience.
Background

This Submission is in response to a request by the Department of Infrastructure, Transport, Cities, and Regional Development in seeking input to design of the National Freight Data Hub\(^1\).

The need for better freight data was a major focus of the *Inquiry into National Freight and Supply Chain Priorities*. It is also an important part of delivering the National Freight and Supply Chain Strategy. Better freight performance and location data is one of the major action areas in the associated National Action Plan. These needs are consistent with the recommendations in iMOVE’s *Freight Data Requirements Study*\(^2\). Deakin University Centre for Supply Chain and Logistics contributed to the *Inquiry into National Freight and Supply Chain Priorities* and the iMOVE *Freight Data Requirements Study*.

**Question 1:**
**What are the most important purposes of the Hub?**

We regard the following as an important purpose of the National Freight Data Hub, particularly from the perspective of undertaking industry relevant and policy-oriented research and analysis. This will involve collection and sharing of (existing and new) data for industry and policy research and analysis into:

- Better use of existing resources (roads and rail networks, ports, warehouses and distribution centres, available land, other infrastructure and capital equipment, labour) in freight and supply chain activities across industries and locations (i.e. regions, states etc.);

- Use of new resources (through new investment, new skills and capabilities, new technologies) to enhance the productivity of freight and supply chain activities across industries and locations; and

- Estimation of performance measures such as freight industry productivity by modes of freight transport, key freight tasks, industry sectors and regions.

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\(^2\) Ibid
Question 2:
What are the most critical things (e.g. data) to include in the Hub?

There already exists considerable amount of freight-related data held by government agencies (e.g. BITRE) and in infrastructure entities and firms (e.g. ports and freight companies). However, most of the data and information held by the infrastructure entities and firms are not publicly available due to several reasons, mostly related to commercial and confidentiality concerns. Nevertheless, such data has an important role to play in providing insights into the current status of freight, such as benchmarking competitiveness in terms of key performance indicators including delivery times across commodity types, across regions and across different modes of freight transport. Given this background, we regard that the inclusion of following data categories as critical in the National Freight Data Hub:

- Origin-destination location, delivery time, lapsing time, quantity (volume or weight), price/cost and value data related to products being moved along key supply chains using unimodal and/or intermodal freight operations;
- By key commodities both for trade and domestic use and key domestic and international destinations;
- Cost of transportation by commodity (bulk or container), between origin and destination locations relating to key supply chains
- Utilisation levels/rates of freight modes (e.g. trucks, fleets), road and rail networks, port terminals etc.; and
- Level of employment, age profile, skill levels, and gender and diversity data related to various freight tasks along key supply chains.

Question 3:
What are the barriers to sharing data?

There are two broad categories of barriers or constraints to sharing data, namely data quality related issues and administrative/management related issues. These include:

- Lack of compatibility and/or poor linkage between data from different sources
• Data quality related issues: lack of standardisation, computational and methodological issues etc.

• Administrative and management related issues:
  • authority to access and share data,
  • vulnerability to changes and discontinuance of data sources,
  • legal and regulatory constraints,
  • confidentiality and industry/firm/public perceptions

Quality related issues

Relevant freight data from various sources could be managed much more efficiently if common identifiers for specific data variables would be introduced and used. The use of unique identifiers for data variables would make it possible to combine data from different sources and from various surveys with each other. This would greatly reduce the burden on data sources while significantly increasing the available data. This would also make it possible to introduce a building block approach in freight data, which would mean that data would be collected in the manner best suited for the purpose and would then be reused by combining with other data sources.

Challenges could also arise when different data sources employ different units of measurement, definitions of variables and coding systems. Definitions of units of measurement in freight industry data are influenced by the function of the industry entities. Hence, their definition of a unit may differ from the definition of a unit by a government agency. Differences between definitions of units of measurement can limit the utility of the freight data source, especially for purposes that involve linking micro-data.

Differences in the definitions of variables or related concepts can produce inconsistencies between industry and public sector sources. Challenges that arise as a result of using different coding systems are related to those associated with differences in definitions of variables and units. A public sector agency, for example, may require a more granular coding system than the system needed by an industry entity.

Freight data from different sources often require editing, imputation and integration with other sources before use as quality assured freight data products. Managing such data leads to significant computational challenges. Because there is rarely a one-to-one correspondence between identifying variables in different datasets, data linkage is not straightforward.
Increases in the capacity and speed of computing technologies/environments make it increasingly easier to use industry data. However, it requires significant investment in IT and computing resources.

**Administrative/management related issues**

One of the key challenges in developing the National Freight Data Hub is to address any concerns over having the authority to access and share data and the support from the respective data custodians. This requires effective consultations with custodians, stakeholders and data users. Authority to access and share data is influenced by the ‘trust’ factor. When data providers trust that their data will be used as they have agreed, and accept that enough value will be created, they are likely to be more comfortable with its use. This acceptance is referred to as a social licence. Creating the conditions in which data can be accessed, shared and used will also require that the data providers are comfortable with how their data is being used. They also need to trust the organisations that are using their data.

Increasing the use of freight data will require long term investment and commitment to develop partnerships with data custodians, and to assess the suitability of their data. A substantial challenge or risk to be dealt with is the fact that industry data sources are created and controlled by others, for example, for commercial purposes. This makes the National Freight Data Hub vulnerable to potential changes or discontinuance of the data sources as the needs of industry data sources change. The impact of delays in supply, or changes to industry sourced data content, could have a serious impact on data products. The relationship with the industry sources of data and the data delivery processes must be carefully managed to ensure that these risks are managed.

Access to industry sourced data may be limited by legal and regulatory constraints, for example to protect the confidentiality of individuals/firms in the population of interest. A memorandum of understanding is often needed to establish a flow of data from an industry data source to the National Freight Data Hub by explaining the objectives of the Hub and the data requirements of the industry data source to meet them.

The issue of confidentiality regarding data is complex. Publicising the measures used to ensure the confidentiality of industry sourced data and the industry benefits derived from utilising such data can help to minimise any scepticism. It is noteworthy to recognise the importance of laws/legislation and policies enabling a public agency to access industry sourced data.
Question 4: What Hub products to be made available?

At present, the availability of relevant freight related data from industry sources for direct incorporation into the National Freight data Hub is likely to be very limited and piecemeal. A key challenge is to find ways to cost-effectively access, extract, transform, verify, validate and use the relevant industry sourced freight related data to complement the data sourced from public sector sources.

The ability and the willingness for industry data custodians to share their data and information with the National Freight Data Hub in a useful way will be a challenging issue that needs to be addressed.

Understanding and harvesting the relevant industry sourced data and information will involve detailed engagement of the National Freight Data Hub with industry sources.

As a matter of priority, this industry engagement process should be initiated with industry data sources who collect data on a regular basis. The National Freight Data Hub can work with industry data custodians to ensure, for example, the quality and integrity of the data being collected, reconciliation of different sets of relevant freight related data, internal cohesiveness of data and reduction of any data gaps.

The task of accessing and sharing directly collected industry-sourced data and information is a medium to long term exercise. There are no easily identified short cuts or quick wins in this process. This will be time consuming and resource intensive at the outset. It will be a multi-year process involving industry by industry data collaboration and partnership discussions to identify, access and share the relevant freight related data. Once established much less effort will be needed as parts of the processes can be largely automated.

These steps are underpinned by the recognition that meeting the rising demand for historical and real-time and additional freight related data by users cannot be fulfilled by the Government alone.

It needs identifying what data is required; what data currently exists and what the gaps are; the appetite for sharing data; and options for operational and governance frameworks.
Concluding remarks

In summary, first, make available the easily accessible and exiting spatial and time series data related to key freight tasks along major supply chains: in a single repository – the National Freight Data Hub. A number of government-held data sets could be released in a timely manner, with their limitations articulated, for the use of industry.

Second, gradually expand the data base to include those highlighted in ‘What data to include’ and based on data gaps. Harvest, access and share relevant freight data being collected by various non-mainstream sources (e.g. industry bodies, various Commonwealth and state government agencies, academic institutions etc.). This will be a medium to long term task; will be time consuming and resources intensive; will need collaboration/partnerships between data holders to identify, quality assure, access and share data.

Third, it is important to recognise that ‘trust’ can be built with industry through the sharing of public sector freight related data that would support industry needs. The aspects of freight related data provision, sharing and transparency apply to both the industry groups and the public sector agencies. Many freight related data collected and held by the relevant public sector agencies should be shared and by building this aspect of the National Freight Data Hub industry trust and confidence will also increase.

Lastly, it is vital to demonstrate the value proposition for industry for each data set to be considered for inclusion in the Freight Data Hub. It is advised that the Freight Data Hub develops criteria and value tests for any dataset that is under consideration for inclusion.