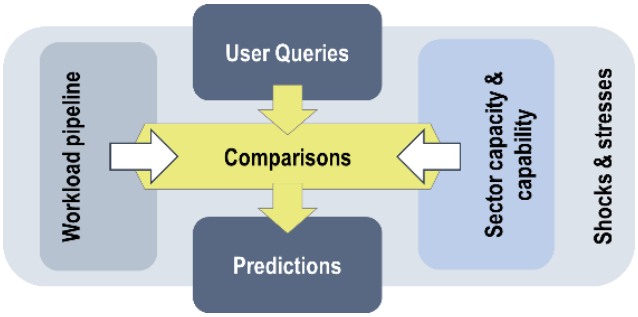
# CanConstructNZ

CanConstructNZ is an MBIE-funded research and development programme to establish an enduring facility for reliable views of sector workload and the capacity and capability of the sector to deliver it. We are creating a tool to gather supply and demand information, incorporating shocks and stresses uncertainties, able to make comparisons and provide targeted information and predictions for a variety of users.

Our fundamental aim is to bring security and balance to the sector, benefiting all New Zealanders.




*The principles are straight-forward - the devil is in the detail*

## Who will use it?

There will be many users, each with different perspectives and needs, such as, a local authority wanting to know whether roading in the draft 10-year plan will cause too much pressure local contractors, or a leader in the sector wanting an objective view of impending residential work in their region over the next five years, and so on.

## What do users think?

Many potential users across our network respond very positively to the concept, commonly saying: 'NZ needs this, make it happen.'

## How are we developing CanConstructNZ?

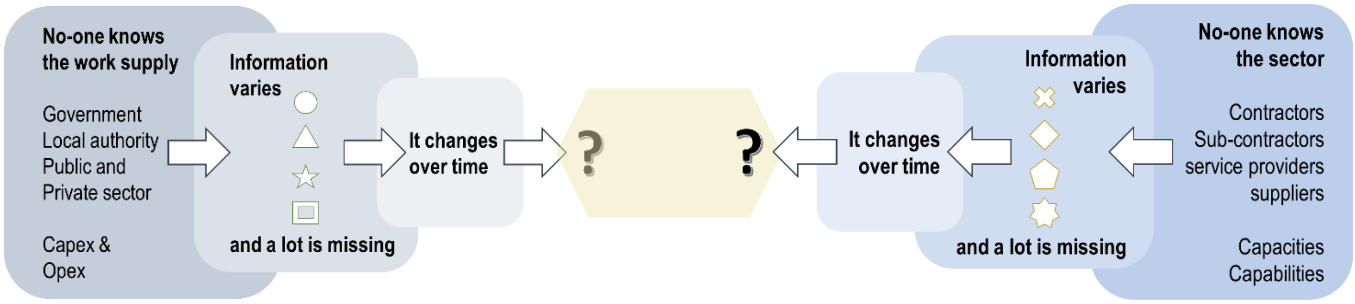
We are embarked on an evolutionary process, from understanding available information, how limited data can be used to provide advice or predictions, progressive engagement with authorities and players to provide more and better data, and the evolution of the interrogation, collection, and processing to provide answers or predict trends. In the fullness of time, we expect that data will be made readily available by programme leads and sector players, enabling a fully functioning tool enabling effective planning and balance of supply and demand.

### Beginnings

Three years into the programme we have good data from three generators of work programmes, have done case studies to learn how to manage it, and created a proof-of-concept comparator, including simple allowances for shocks and stresses that may impact typical programmes and we have harvested the 10-year plans for all local authorities. Our summary reports describe procedures, methods, and first pass outputs to be shared with our data providers.

## Problem

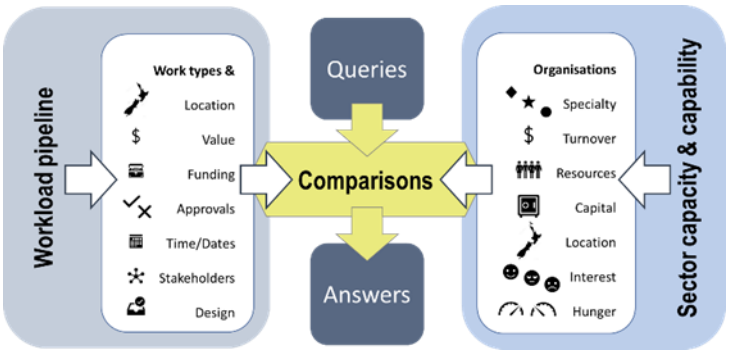
Despite this work, we are very concerned with the general lack of information. As an overview:




We believe that there is a significant contributing factor in this problem, which is distrust. The originators of projects do not want to show their hand and the sector players do not want others to know things about them. However, we believe that once these parties understand how little information is needed to enable CanConstructNZ and how it will be used collectively and not individually, with no risk of disclosure, attitudes will change.

## We know what we need

For the CanConstructNZ tool to function it needs reliable pipeline and sector information including key identifications (data) to enable quantification and delineation of programme/project work type, and the corresponding portion(s) of the sector to enable comparisons and output results. This looks complicated when the following diagram is studied.

| | | |
|---|---|---|
| Contributors<br>Published plans<br>Published approvals<br>Published outcomes<br>Precursors and dependencies<br>Uncertainties<br>Appropriate detail |  | Enterprises<br>Standings<br>Achievements<br>Associations<br>Needs<br>Outlooks<br>Limitations<br>Consistent details |

## The Data Model

However, what we have found from working through the principles of the preceding diagram is the identifiers and values about projects, the sector, and shocks and stresses needed to make useful observations and demand-supply comparisons are not large in number. Neither are they complex. Nor do they need to present sensitive information. Nor does the answer to user queries need to disclose specific project or sector organisations.

In summary terms we believe it is surprising how little needs to be known before a useful, sound, demand v supply comparison can be made and there should not be insurmountable barriers to providing details by either a project sponsor or a sector organisation.

The following tables set out our view of the data models involved. These are presented for review and discussion of two key elements that arise:

- Do you agree that these models could provide you what you need to know?
- Do you see any shortfall in information that would be available from a comparator mechanism limited to these sets of information?

## Projects

**Projects**

The pipeline is comprised projects and programmes of projects, which we need to identify to enable use case comparisons with capacity and capability of relevant parts of the sector.

The following is CanConstructNZ current thinking on the appropriate model for project data, a list of identifiers enabling comparator, with values to be set to each (one or more as appropriate).

Unique project identifier (automatically created by CanConstructNZ)

Location (GPS Lat and Long)

Location region (LG region)

Project Value. It is proposed that project values do not be individually reported, nor used in the comparator modelling with accuracy beyond that needed for multiple project use case supply and demand comparisons. Therefore, take the construction-only estimated or contracted $ value and round it up as follows:

| **Project value** | Up to $20m | $20m to $100m | $100m to $250m | $250m to $1bn | Over $1bn |
|---|---|---|---|---|---|
| **Value for model** | Nearest $1m | Nearest $5m | Nearest $10m | Nearest $10m | Nearest $50m |

Project Type:
Civil, Commercial, Environmental, Housing, Industrial, Institutional, Utilities

~~Resourcing~~ (To be discussed)

Status (The current phase from the sequence of project life: initial concept, concept, approvals, design, contract, construction, completion, maintenance)

Priority (one of: ASAP, scheduled, flexible)

Funding (one of: unfunded, funding approved)

Procurement (One or more of: unknown, undecided, bid, negotiated, early contractor involvement, collaborative)

Start date (The start normally related to the construction phase but may be attached to other phases, depending on the nature and status of the project. Expressed Year and quarter)

Duration (A calculation by the comparator mechanism, based on Type and Value)

Risk (A risk factor selected from a matrix of Start date delay units (quarter year), based on Project Type, Funding, Status, and Value. The proposed matrix has not yet been generated, and is subject to discussion)

## Sector Organisations

| **Organisations**<br>The sector is comprised of a myriad of organisations, about which information is needed to allow assessment of sub-sector capacity and capability to do work, relating to types of projects – for demand-supply comparisons.<br>The following is a current CanConstructNZ suggestion of a data model for sector organisations as a list of identifiers with values in parenthesis, one or more which may apply. |
|---|
| Unique organisation identifier (created and maintained within CanConstructNZ) |
| Location (~~post code~~, LG Region) |
| Turnover and Tier (Express turnover as a whole number of the same order of magnitude of actual turnover the last say three years. This will then place the organisation in one of the following tiers, currently set in relatively arbitrary bands of: Tier 1, >$100m/a; Tier 2, $20-100m/a; Tier 3, $5-20m/a; Tier 4, <$5m/a<br>CanConstructNZ has assumed the number of organisations in each tier for current modelling (for each of H & V) as follows:<br>T1: 6X for both H & V, T2: 25 ditto, T3: 250H & 750V, T4: 1,500H & 5,000V. |
| ~~Suppliers / Supply chain~~ (To be discussed) |
| Specialisation (A list of work types able to be conducted by the organisation is still to be landed, but for now is assumed to match the project types: Civil, Commercial, Environmental, Housing, Industrial, Institutional, Utilities) |
| Role (One or more of: Investigation, Design, Advice, Management, Supply, Construction, Maintenance) |
| Resourcing: Describing how an organisation carries out work is a vital statistic for understanding the capacity of the sector. Identify actual spread of input to others / self-deliver / outsource, similarly to the following table, for the tier which applies to the organisation.<br>The quantities shown in this table are those which CanConstructNZ has assumed apply to the sector in current modelling, until actual data is collected and averaged: |

| | | | |
|---|---|---|---|
| **Tier 1** | NA | 40% own | 60% subcontracted |
| **Tier 2** | 10% subcontracting | 40% own | 50% subcontracted |
| **Tier 3** | 50% subcontracting | 30% own | 20% subcontracted |
| **Tier 4** | 80% subcontracting | 20% own | NA |

| |
|---|
| ~~Resource~~ (To be discussed) |
| Experience (Express as acceptable, moderate, or very, based on a proxy of years established, in three bands <3, 3-6, >6) |
| Reputation (Express as satisfactory, good, or very good, based on the following number of references available: <2/annum, 2-5/annum and >5/annum) |
| Bidding success (The relevance or useability is questionable, but express as satisfactory or good, based on two measures: less than 1 in 5, or better than 1 in 5) |

| |
|---|
| Excess capacity (Express as none, some, or significant, based on the ability to take on more work, assessed in three tiers: None, some to 20% more, 20% to 40% more. Note that more than 40% should be regarded as unreliable) |
| Hunger (interest in new work, described as: Low, Medium, High) |

## Shocks and Stresses

The following is not in the same form as the preceding but is the list the resilience team contributed to our recent workshop.

| **Shocks and Stresses**<br>The following are identifiers of shocks and stresses, expressed as broad categories. When these are allowed for as appropriate to each use case query, each with their risk filter applied, then a 'Monitored influence' factor is introduced to the process, changing the output from the comparator mechanism. |
|---|
| |
| Type (Man-made – social, political, legal, technological, economic, and Natural - environmental) |
| Region (Local, National, International) |
| Risk analysis, a filtering process (Applying usual risk management sequence, with resulting impact factors on pipeline (specific projects or groups or all), sector (similar), or both) |
| Recovery time (Estimate in years) |
| Cost impact (a multiplier against project construction cost) |
| Other impacts (measurable or not) |
| |