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CONSTRUCTING EXCELLENCE

Pathfinder | project 18

Auckland City, the home of New Zealand's largest road network and most robust maintenance lifecycle benchmarking programme

Auckland City Council Supply Chain Benchmarking

Client: Auckland City Council

Contractor: 9 Suppliers over 16 contracts

Publication Date: August 2010

Region: Auckland

Sector: Roading

Total Project Value: $100m, first year

Project Timescale: July 2009 to June 2012

BENCHMARKING PROGRAMME ACROSS AUCKLAND CITY MAINTENANCE CREATES CONTINUOUS IMPROVEMENT AND DELIVERS OVER 5% IMPROVEMENT ACROSS ALL CONTRACTS IN THE FIRST YEAR.

New Zealand's largest Local Authority road maintenance contracts shine after a year of measurement and continual improvement. One year after initiating KPIs and Benchmarking across its full range of road maintenance activities Auckland City Council's supply chain have made significant and measurable progress.

Background

This Pathfinder Project provides a review of Auckland City Council's "**Supply Chain & Continuous Improvement Club.**"

Since June 2009 Auckland City Council Transport Division (Auckland City) has introduced and developed a supplier management process that has created a culture of innovation, competition and continuous improvement.

Systematic performance measurement is used to highlight changes required, monitor improvements and flag the areas that need wide management support for both the supplier and Auckland City.

Key Performance Indicators (KPIs) have been used to measure the performance of individual contracts and a full benchmarking system has been developed and used across 16 Auckland City roading contracts (maintenance/renewal; major capital works; and minor capital works contracts).

These contracts cover nine suppliers across the whole of the Auckland City area.

All suppliers are grouped together as the **"Supply Chain & Continuous Improvement Club"** which started life in July 2009.

The concept of the Club has been used to drive improvements across the whole of Auckland City maintenance by bringing the individual suppliers together to benchmark performance against each other and share ideas on how to improve and share Best Practice.

The club covers the whole asset life cycle and its team members are set out in figure 1 below. The Contracts (plus Minor Safety) cover four geographical regions of Auckland City, being South, East, West and the Hauraki Gulf Islands.

Delivery stage	Asset Management	Design	Physical Works
EXTERNAL SUPPLIER	GHD Opus	Beca Opus	ARMA-West Maintenance Alliance (Auckland City Council, Leighton's, Blacktop + MWH) Fulton Hogan Downer EDI Works Transfield John Fillmore Contracting Interclean
INTERNAL CLIENT/SUPPLIER	Auckland City Council Asset Management Team	Auckland City Council Transport Delivery Group (TDG) Project management team	Auckland City Council Transport Delivery Group (TDG) Project management team

*Figure 1: The Auckland City **"Supply Chain & Continuous Improvement Club"** members*

Challenges Faced

Full Scale measurement The scope and range of the agreed KPI set is the largest used in New Zealand. The KPIs are of two types:

- **General KPIs** for benchmarking and performance improvement;
- **Contract KPIs** which are used to determine contract reward.

Benchmark (industry average) scores are established through comparison to data already collected and held by Auckland City Council, the ARCG (Auckland Regional Contract Group) Benchmark Club and also overseas maintenance data (predominantly from the UK).

The KPI selection has been developed to align with the National KPI framework. This framework uses a standard set of measures, which cover performance in five key areas:

- **Satisfaction (Customer and Supply team)**
- **Time**
- **Cost**
- **Quality**
- **Health, Safety and Environment**

Constructing Excellence New Zealand Ltd. (CE-NZ) was engaged by Auckland City Council to facilitate and help develop the benchmarking culture. The project focused on:

- the introduction of Key Performance Indicators (KPI's) into Auckland City Council roading/footpath maintenance, rehabilitation and renewal works; minor and major capital works projects;
- the formation of a best practice club across the full service delivery team – from asset management to construction, to maintenance;
- implementation of contract-based qualitative, quantitative, 'lead and lag' KPI's to align supply team behaviours with previously ascertained client long-term values.

The resulting KPIs provide evidence of performance against pre-determined benchmark, which is linked to the contractual reward model.

Adapting the National KPIs for maintenance The National KPIs have been traditionally used for measuring capital projects so there was a certain amount of clever thinking required to adapt them to measure maintenance activity, especially in defining criteria around measuring the predictability of time and cost.

Each KPI is measured at a particular Gateway (see figure 3 below). The Gateways represent a point in time in a traditionally procured project. Maintenance activities are more fluid than a project, however, the team managed to work around this by defining discreet "packages" of work which could then be measured acording to whether they were completed on time, within budget etc.

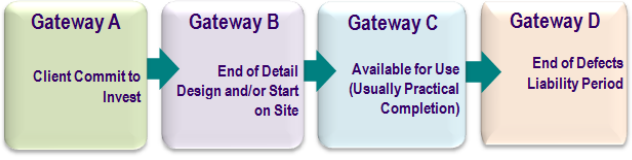

Figure 2 The National KPI Gateways

The team adapted the above process into six key Gateways which align with the National KPIs. Figure 3 shows the Auckland City Gateways.

This whole process had the effect of improving the discipline across the full lifecycle for the maintenance activities

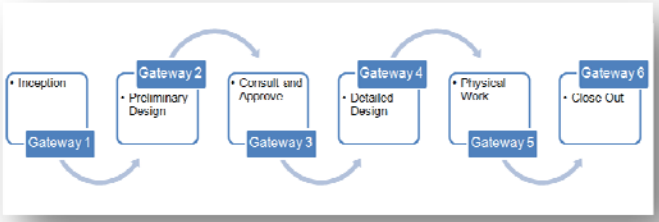

Figure 3 The Auckland City KPI Gateways

Workstreams Each Contract comprises one or more specific Workstreams, e.g.

- Roads Reconstruction,
- Structures,
- Drainage etc.

KPIs have been allocated to each Workstream within a Contract. Therefore the KPIs are measured at a Workstream level and either reported for each individual Workstream or aggregated up to a Contract level.

Each Contract was allocated a specific Handbook which shows the Contract Specific KPIs in detail. Figure 4 illustrates one example

		KPIs	TIME				
Elements	Handbook No. & Contract	Workstream	T1	T2	T2.1	T3	T5
Asset Man.	1 & 2 – Asset Man. - Roads and Structures	Heavy Transport.	tbc		Y-G1		Y-M
		Condition Survey			Y-G1		Y-M
		Pmd. Works Planning.			Y-G1		Y-M
		Feasibility Reports.			Y G1		Y M
	3 - Asset Man. - Street Lighting	Street Light – Asset Man			Y-G1		Y-M
Design	4, 5, 6 & 14 - Design Roads, Structures, Drainage	Roads – Recon					
			Y G4		Y G4	Y G5*	Y M
		Roads - Rehab	Y-G4		Y-G4	Y-G5*	Y-M
		Structures					
		Drainage					
	7- Design Streetlighting	Street Light Design	Y-G4		Y-G4	Y-G5*	Y-M
Physical Works	8, 9, 10, 11, 14 - Construction	Roads - Recon		Y G3	Y G3	Y G5*	Y M
		Roads - Rehab		Y-G5	Y-G5	Y-G5*	Y-M
		Response					
		Capex		Y-G5	Y-G5	Y-G5*	Y-M
	12 & 13 - Footpaths	Footpaths		Y-G5	Y-G5		Y-M
	15 - Cleaning	Cleaning		Y-G5	Y-G5		Y-M
	16 - Street Lighting	Streetlighting		Y-G5	Y-G5		Y-M

KEY	
Y-G1	Yes - KPI measured at Gateway 1 (G1) for Projects or Packages reaching G1 within the month
Y-M	Yes - Monthly across the Contract
Y-G4	Yes - KPI measured at Gateway 4 (G4) for Projects or Packages reaching G4 within the month
Y-G5	Yes - KPI measured at Gateway 5 (G5) for Projects or Packages reaching G5 within the month
Y-G5*	Yes - KPI measured at Gateway 5 (G5) for Projects or Packages WHERE THE DESIGN AND CONSTRUCTION ARE SEQUENTIAL reaching G5 within the month
Y-G6	Yes - KPI measured at Gateway 6 (G6) for Projects or Packages reaching G6 within the month

(Time Predictability) of how the KPIs are adapted and measured across the full lifecycle of Asset Management to Delivery and for each Contract and Workstream.

Figure 4 KPIs measured at Gateways across Workstreams and Contracts.

360° Measurement It is important to notice that many of the KPIs are 360°.

The client's performance, along with the suppliers, is measured and reviewed by the suppliers.

This 360° measurement really binds the whole team into performing at every stage in the asset's lifecycle and highlights where any bottlenecks may be along the process.

Figure 5 The Auckland City Benchmarking Club web access portal used by all suppliers and Auckland City's own Project Managers.

Successful Outcomes

Robust Performance Data

Project performance is scored on a monthly basis and reported quarterly through a web based portal. Information is collected from over 30 Key Performance Indicators (KPIs) under five key headings

- **Satisfaction,**
- **HS&E, (Health, Safety & Environment)**
- **Time**
- **Cost**
- **Quality**.

The data is predominately collected from independent sources and covers qualitative and quantitative information. A robust data set of over 800 pieces has been established and validated against local, national and international data to ensure the data set and performance scores are robust.

Focus on Client Values and Outcomes

The key to the Club's success is the time spent on defining the Client's values and outcomes and establishing KPIs to measure supply chain performance in delivering these valued outcomes. By setting Benchmarks for performance the Client and supply chain can see whether the required standards are being met.

Full team involvement + 360° reviews

Auckland City Council's full maintenance regime is a long term and complex process. It covers Asset Management assessment and review, scheme prioritisation and funding applications, design (from scheme assessment to detail design) and full range of road corridor maintenance services both planned and reactive (carriageway remediation, surface improvements, footway re-construction, Streetlighting and street cleaning activities as well as reactive maintenance.

To ensure that the whole process is reviewed and not just the discrete delivery elements, the Club's measurement system stretched from Asset Management to construction and measured the performance of the in-house project management team as well as the external consultants and contractors. This has allowed the impact across the supply chain 'neighours' of poor and positive performance of each element of service.

Independent system and training

The use of an established KPI system and trained facilitators helped to establish the KPI regime. Specifically the external consultant was able to use their experience to set realistic time scales for development, adoption and embedment of the new ideas with the team.

Robust set of KPIs – lead and lag – hard and soft measures – KISS ("Keep it simple, stupid")

The use of lag KPIs (KPIs that measure final outcomes) provided data on the historic performance of the teams. These are either hard or quantitative measures (Time, Cost Lost Time Injuries etc) or soft or qualitative measures such as (Quality and Satisfaction). To ensure robust data collection, standard questionnaires were used for qualitative data collection. For the measurement of design qualitative data, a set of expanded detailed questions were established to define desired levels of design performance.

KPIs are also set to change behaviours, (lead KPIs) to match those that the Client Values. Introduction of these lead KPIs led to members of the supply chain adopting new behaviours or practices in order to reach the measured performance targets the client required.

Two examples of these lead or behaviour KPIs are shown in the site based H&S audits and reviews of Temporary Traffic Management practices which are carried out across the contracts.

The team achieved a good balance in the KPI set across lead and lag KPIs and also the qualitative and quantitative KPIs. This provided the team with a strong and robust data set, which was aligned to Client Values and also positively influenced behaviours

Figure 6 The Auckland City KPIs in five core suites

Allowing Time to learn adapt and implement

One clear message from the team is that it makes many months to build up confidence in the process and the data and also for all the team to come up to speed in using the data.

Targets by agreement

Another clear message is that targets need to be agreed by all team members and should be based on good international or national Benchmarks, well argued reasoning and be related to agreed current levels of performance.

For this team, 6 months of data was collected to establish the baseline performance of the teams before Targets and Benchmarks were discussed and added. Team members then responded well to believable and achievable targets.

Comparison of contract performance

Two of the geographical term maintenance contract areas were run under traditional contracts (East and South) whilst the third was an Alliance contract (ARMA West).

Because the Club covered both the design and construction work streams, all the road corridor maintenance functions and measured the Client performance, accurate comparisons are able to be made between the two models.

Elements for Client overhead in administering the two contracts were included and the output can be judged on price and non-price attributes. Significantly this work will be taken forward into the decision making process for both extending the existing contracts or changing the contract forms.

Tools for review and improvement

One of the primary aims of the Club was to raise performance through continuous improvement. Four routes were used to achieve this – High level KPI data was reported quarterly to the Contract Management Meetings and Club Meetings, whilst more detailed information went to the Monthly Project Meetings and overall system review

Quarterly meetings

Overall performance was reported at Quarterly meetings – here overall trends and performance against Benchmarks are reviewed.

Figure 7 A typical high level dashboard report, accessible by all via the internet, showing performance across the five core suites for the current quarter, for the year and the current month.

Because the Quarterly review was set at a Contract and geographical area level, open and honest discussions take place without reference to the detailed KPIs of individual Work Streams (projects). Specifically, the detailed application of general standards and required or expected performance were discussed and agreed.

Reports take the form of easy to read 'dashboard dials' and show rolled up KPIs under the five main headings. Figure X shows a sample of this quarterly report.

The Monthly Reports

The Monthly Report provide Work Stream (project) and contract specific data for the client and supply chain Project Managers to review at their monthly contract performance meeting. Here, specifics can be reviewed with an opportunity for both teams to objectively review progress and any roadblocks to improvement. Both teams are able to elevate any concerns to the Contract Management Meetings. Examples of the reported data shown in figure 7.

Tools for Root Cause Analysis

The system reviews looked across all the data and contracts. They specifically looked at the interaction of the discrete contracts on each other. Significantly, it was often found that poor performance in a specific KPI of one contract element was caused by impacts outside that contract area.

By using the non- adversarial quarterly Club Meetings to highlight these issues, the Client could acknowledge genuine impacts.

Where necessary, two actions then resulted. Firstly the KPI affected by an outside influence was noted and removed from any performance bonus review. Secondly, root cause analysis was undertaken to establish the blocker within the overall delivery process.

Significant progress is being made in streamlining the overall delivery process through root cause analysis of the blocker appearing at a contract or Work Stream (project) level – often these involve the non-timely delivery of funding or information by third parties.

Key principles for repetition

- Measure performance across key areas such as Time, Cost, Quality, HSE and Satisfaction
- Benchmark contracts with each other and find alternative external sources to benchmark against.
- Use the National Industry KPIs (see www.constructing.co.nz for more information)
- As a client, lead the process and establish a fair, open and honest environment in which suppliers can positively thrive on lifting performance as a team.

Summary of Benefits

- Significantly improved performance
- Comparison of contract performance
- Aligns Client Values to supply chain actions and behaviours
- Reinforces good behaviours
- Develop and share good practises across contracts
- Root cause analysis for systems review
- Provides a measure and comparison of performance and value – not just absolute cost

Lessons learned

Key lessons to take forward from this project are:

- Keep KPIs simple and universal, keep the paper work simple and clear,
- Use a common scheme for Benchmarking,
- Build up a robust and trusted data set,
- Be open an honest – listen and involve all parties to agree outcomes and process - allow information to be shared without blame,
- Publish results and keep team engaged – make it worth their while

Key Client Actions

This project demonstrates a number of areas where the client directly and positively affected the outcome of the project **for all**, by adopting specific Collaborative Working practices, including:

- **Client Leadership:** By creating a desire for improvement and introducing a fair and open system of measurement at the beginning of the process, the client led the supply team from the outset.
- **Setting Values:** Understanding the nature and priority of the necessary Client values and the expected trade-off implications, (cost, time, quality – training etc.) and setting targets that reflect these values so that the supply chain have a clear sign-post to expected behaviours and outcomes
- **The Long View:** New systems and processes need to understood, absorbed and accepted before change can then take place. Understanding that permanent change takes time and commitment.
- **Celebrate Success:** By running a fair and open system that allows discussion and improvement without blame but where project level responsibilities are taken seriously and project leaders are accountable to their peers.

Conclusion

This case study demonstrates the long term benefits measuring performance and Benchmarking across a complex set of contracts. It is the first National multi-disciplinary 360° Benchmarking Club in New Zealand and has involved a significant amount of commitment from all the players involved to make it a success.

Generally, there was a measurable improvement in performance in the first year (over 5% across all measures and contracts) with the Client's target for overall improvement exceeded.

This improvement reflects well on the effort of all the Client and supply chain. Specifically, behaviours and performance have significantly lifted in those areas of key value to the Client and especially in areas where previous performance levels were not acceptable. For example, on-site H&S behaviours and performance, Temporary Traffic Management planning and execution have improved considerably.

Overall, the year has involved much hard work, especially in the early months when the input level was high and the results were either patchy or the data set incomplete. However, as the first year closed, the teams efficiency in using the KPIs improved, understanding grew and the data set became robust.

Now it is apparent that the team have made a measurable difference and that the commitment required has resulted in the additional value gained for the Client and their Stakeholders on the $100M maintenance spend.

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For further information on NZ Pathfinder Projects visit

ARMA West - Auckland Maintenance Alliance