Best Value at the Directorate-General for Public Works and Water Management in The Netherlands:  
A Case Study of the Procurement of Infrastructure Projects Worth $1,200M

Jeroen van de Rijt  
Scenter Management Consultants  
email: rijt@scenter.nl

Wiebe Witteveen and Carlita Vis  
Rijkswaterstaat / Directorate-General for Public Works and Water Management  
email: wiebe.witteveen@rws.nl  
email: carlita.vis@rws.nl

Sicco Santema  
Scenter Management Consultants  
email: santema@scenter.nl

Rijkswaterstaat, part of the Dutch Ministry of Infrastructure and Environment has used the best value PIPS philosophy to procure infrastructure projects worth circa $800M. This is a case study of the largest PIPS pilot project in the sixteen year development of the best value PIPS, and tests the robustness of the PIPS philosophy within the constraints of the European law. Eleven adaptations to the original methodology are outlined and discussed. The procurement results of six tenders are outlined. (This paper is an updated version of the paper as published in the Conference Proceedings of the CIB 2010 Manchester Conference (May 2010))

Keywords: Best Value Procurement, the Netherlands, PIPS, Rijkswaterstaat

Introduction

Rijkswaterstaat is the government agency whose role is the practical execution of the public works and water management, including the construction and maintenance of waterways and roads in The Netherlands. It is part of the Dutch Ministry of Infrastructure and Environment. Rijkswaterstaat is using the philosophy to procure infrastructure projects worth circa $800 M. This paper reflects on the use of PIPS within this project, the world’s largest and most aggressive PIPS pilot. The structure of the paper is as follows. First, Rijkswaterstaat as an organization is described. Then the background of the program is provided. Next, the set up of the process is described. Then differences of the application of the philosophy within Rijkswaterstaat (in comparison to the “pure” PIPS process as developed by Dean Kashiwagi; (Kashiwagi, 2009)) are outlined. This is followed by a description of the results of the procurement phase of the projects. The paper finishes with a summary and conclusions.
Introduction to Rijkwaterstaat

Rijkwaterstaat is the executive arm of the Dutch Ministry Infrastructure and Environment. On behalf of the Minister and State Secretary, Rijkwaterstaat is responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands. Rijkwaterstaat manages the country’s main road network, main waterway network and main water systems. It is responsible not only for the technical condition of the infrastructure but also, and especially, for its user friendliness. It facilitates the smooth and safe flow of traffic, keeps the national water system safe, clean and user-friendly and protects the country against flooding.

Rijkwaterstaat has changed dramatically since 2003. In accordance with the Business Plan Rijkwaterstaat introduced in 2004 the organisation has been transformed into a public-oriented government organisation that concentrates on its tasks as network manager. As part of the Business Plan Rijkwaterstaat issued Agenda 2012 in 2008 to continue this process in the next four years. The goal is to become a leading sustainable and public-oriented executive arm of government by 2012.

Background of the program

The road network in the Netherlands (specifically the Randstad area) is heavily congested, with unreliable journey times of one in five during the rush hour. Most of the traffic jams in the Netherlands (81% in 2005) are concentrated in The Randstad. (The Randstad (a city at the edge of a circle, with empty space in the centre) is a conurbation in the Netherlands. It consists of the four largest Dutch cities (Amsterdam, Rotterdam, The Hague and Utrecht), and the surrounding areas. Its 7.5 million inhabitants make up almost half of the population of the Netherlands). In the Netherlands there are extensive procedures preceding road construction. The average lead-time from idea to new road is over 20 years (!). A law was passed called ‘Besluitvorming Versnelling Wegprojecten” (translated: “Decision for Accelerated Road projects”). This law simplifies some public procedures concerning environmental issues for 30 specific road bottlenecks starting January 1st, 2009. This enables Rijkwaterstaat to take some quick measures to enlarge highway capacity and reduce congestion on several locations on the Dutch road network. The Dutch Ministry of Infrastructure and Environment has identified 30 major bottlenecks, which need to be (partly) resolved by May 1, 2011.

The procurement strategy focused primarily on the acceleration of the delivery of the projects. Rijkwaterstaat has developed a shorter tender procedure than the traditional way of tendering road projects. The second goal of the strategy was to maintain enough competitors for the projects. Another goal of the procurement strategy was to optimize price and quality (best value). The main reason for using the Best Value Procurement/Performance Information Procurement System (BVP/PIPS) is that the procurement of Design and Build-contracts usually leads to high transaction costs (efforts of all possible suppliers) and long tender procedures. In 2009 the tender capacity in the Dutch market was limited. Therefore suppliers have asked Rijkwaterstaat to develop a procurement strategy heavily based on quality (most economically advantageous
tender (MEAT)) to lower the transaction costs and shorten the tender procedure. As a government agency Rijkswaterstaat has to follow the European legislation on public works.

Rijkswaterstaat has adopted BVP/PIPS for 16 of the 30 bottleneck projects to tackle this issue. In order to resolve the congestion on the highways as soon as possible, the tender process starts before the right-of-way plans (spatial planning) are final. When a draft right-of-way plan is published, stakeholders must approve and agree on legality. In case of environmental issues (noise or pollution) stakeholders can object (appeal) to the road widening. This means that the exact moment that the contractor can start the actual execution of the project is unsure. Appeals may delay the start for half a year or more. Nevertheless the parallel procedures of spatial planning and procurement will contribute to acceleration of a majority of these ‘fast track’ projects.

As speed and quality is of the utmost importance, the BVP/PIPS will be used to select the best suppliers who will do the infrastructural work for 16 selected projects (typical work: asphalting, making acoustic screens, road signs and signals, lighting, adding extra lanes next to existing lanes, renovating bridges, gantry sign / overhead traffic sign, etc). The 16 projects have been divided into 6 clusters. For each of these clusters the Best Value Procurement process has been used.

![Figure 1. 16 projects / 6 clusters](image)

The precise scope of the clusters was not yet completely defined at the start of the procurement. Because of the importance of speed Rijkswaterstaat will award the project to the supplier that best understands the project and the proposal from beginning to end. Rijkswaterstaat will work out all further details with that supplier (the actual design & realization). This methodology has some advantages: it turns up the speed and it minimizes transaction costs for all suppliers. Only
the best value vendor does the detailed preplanning and scope definition work (technical aspects).

Rijkswaterstaat has set up 6 project teams that have used the Best Value Procurement process for “their” cluster. Next to the six project teams there is an overall procurement team (a “core group”) that monitors and coaches the individual teams (authors work for this central core group).

Set Up of the Process

While designing the process, the goal was to stay as close to the original PIPS methodology (as developed by Dean Kashiwagi) as possible, with a few adaptations. In this section the differences between the methodology used in the fast-track project and the “pure” PIPS methodology are described. The differences with the optimized PIPS methodology are outlined as well as why changes were made. The following points will be described:

- Preparation phase
- Procurement phase
  - Past Performance Information
  - RAVA plan (Risk Assessment / Value Added plan)
  - Planning
  - Interview
  - Ranking
- Pre-award phase
- Execution phase

Preparation phase

As normal in Best Value Procurement, the client and the vendors were extensively educated in the paradigms of the philosophy. The paradigm includes:

1. Minimized decision making by the client/buyer.
2. Transfer of risk and control to the vendors.
3. Client does quality assurance (QA), vendors do quality control (QC) and risk management (RM).
4. The client does minimal communication, directions, questions and answers, of the technical requirements to the projects.

A difference during the preparation phase with the “pure methodology” was setting up so called “consultation sessions” or “Intelligence meetings” with each of the individual companies during the tender. In these sessions (2 sessions of 4 hours for each of the companies) the companies had the opportunity to ask questions to the client. The use of “consultation sessions” is standard procedure in The Netherlands when dealing with projects of this size. It gives the vendors an opportunity to find out the risks and concerns of the client (amongst other things). Of course, with the use of BVP it did not seem very logical to talk about risks and concerns of the client (that would be dealt with in the RAVA plan!). Still, it seemed a good idea to have these individual sessions (certainly from an “involvement” point of view; if there were no consultation
sessions, the vendors would not know what to expect). The consultation sessions were also used to, once again, delve further into the philosophy.

**Difference # 1: use of “consultation sessions”, where vendors could ask for more information on the project in an individual setting**

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**Procurement phase**

The intention was to copy the procurement phase as much as possible from the pure PIPS methodology. Award criteria were pricing, risk assessment and value added (RAVA) plans, schedule (planning) and interviews. Still, some changes were made. Below the most important differences are highlighted.

**Past Performance**

First of all Past Performance Information (PPI) was not used. Although the use of PPI has been discussed in The Netherlands for numerous years, no system is “in place” to use PPI. There have been supporters and opponents of PPI. Given the ongoing discussion, it did not seem “wise” to use PPI in this important program of fast-track projects. Instead of using PPI, pre-qualification was used. All interested parties could express an interest in tendering for the contract but only those meeting the selection criteria of Rijkswaterstaat were actually invited to do so. This is the so-called “Restricted Procedure” within European tender regulations. Under the Restricted Procedure any supplier may request to participate (stage 1) in an advertised tender. However only those invited/short listed (stage 2) by the client (in this case Rijkswaterstaat) may actually submit a tender. New suppliers cannot be introduced at stage 2.

This restricted procedure led to the following results (See Table 1)(number of bids per cluster):

<table>
<thead>
<tr>
<th>Cluster</th>
<th># bids</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>6</td>
</tr>
</tbody>
</table>

The consequence of using pre-qualification is that vendors are either “in” or “out”. There is no differentiation between the vendors in the final ranking (like with PPI, which usually counts for 5% in the final ranking). Under European law, award criteria cannot include selection criteria (i.e. financial standing, technical or professional ability).

**Difference # 2: pre-qualification instead of Past Performance Information. This rules out using PPI as an award criterion. PPI can only be used as a qualification criterion.**
RAVA plan

The use of the Risk Assessment / Value Added (RAVA) plan led to some differences compared with the original methodology of Dean Kashiwagi. The first difference is that Value Adds were only allowed as long as the vendors price (including value adds) was below the pre-defined budget ceiling. The rationale behind this was a strict judicial one. Lawyers from the Ministry argued that you cannot allow “options” in a bid: the proposed options needed to be part of the contract (see Van Leeuwen in this Special Issue). The argument is that once you select a vendor and do not make use of the proposed options (e.g.: in hindsight these options are of “no value”), it could have made a difference in the ranking/ the ranking might have been different in hindsight. The second-ranked vendor could have won the bid.

Difference # 3: only no-cost Value Adds were allowed in the RAVA plan

A slight modification in the use of the RAVA plan was made to assess the Risk Assessment independently from the Value Added plan. In the original methodology each team member gives one overall grade to a RAVA plan.

Difference # 4: assessing the Risk Assessment independently from the Value Added plan

Schedule / Planning

The second criterion to rank the pre-qualified vendors was “scheduling” or “planning”. Because of the uncertainties surrounding the “road studies”, it seemed impossible to ask the vendors in days / weeks when they would be finished. If vendors could finish the project earlier than the required date, the vendors could write this in the Value Added plan. “Planning” as a criterion focused only on the logical sequence between the activities and the RAVA plan.

Difference # 5: “planning” (scheduling) was the coherence between milestones and the RAVA plan (instead of the number of days/weeks)

Interviews

In April 2009, before the set-up of the tender procedure was finalised, the principles of BVP (including the way of ranking) were “tested” with the vendors in a so-called “market consultation” (before the start of the tender). One of the findings of the market consultation was that all vendors were (very) satisfied with placing emphasis on quality instead of price. However the findings on the use of the interviews as a ranking mechanism were diverse. Some companies were very comfortable with it, while others displayed hesitation. The core group of Rijkswaterstaat was convinced of the usefulness of interviews as a ranking mechanism. However, from the perspective of involvement of the vendors, the weight of the interviews in the final ranking had to be lowered. Interviews were counted for 20% of the ranking (instead of the proposed 25% or higher).

Difference # 6: less weight to the interviews in the ranking (20% instead of 25%)
The market consultation also showed a need from the side of the vendors to explain the way they saw the project by having the option to choose which key persons they would like to send to the interviews. The argument of the vendors was that the choice of the position of the interviewees would also be a way to illustrate how they see the project. In this case the freedom to choose the position of the interviewees was a way to further explain their vision on the project. This might provide an extra degree of difficulty for the project teams of Rijkswaterstaat, who needed to assess the interviewees: it might be easier to compare two key persons who have the same role/position than to compare two key persons who have different positions. Because the core group of Rijkswaterstaat understood (and agreed to) the arguments of the market, the vendors were allowed to choose 3 key positions (and the corresponding key person) themselves. The vendors could not choose the 4th key person: each vendor needed to send their Project Manager to the interviews.

**Difference # 7: vendors can choose themselves which 3 roles (and corresponding key persons) to send to the interviews**

**Ranking**

Ranking the suppliers was, just like in the original BVP methodology, aimed at finding the best possible vendor (within the given budget). However the ranking method was done in a different way from the “pure” process.

The first difference with regard to ranking was that an extra “safeguard” was built into the process. This was to use two independent scoring teams. Like in the BVP process, each team member rated the Risk Assessment plans, the Value Added plans, the schedules and the interviews individually and independently, after which all individual scores were discussed in the team. This team needed to come to a consensus score. The extra “safeguard” was that for the Risk Assessment plans, Value Added plans and scheduling two teams were installed. This way the process consisted of the following 3 steps:

- Each team member rated the vendors individually
- Coming to a consensus score in a team:
  - The 5 team members of team A came to a consensus score for each of the vendors
  - The 5 team members of team B came to a consensus score for each of the vendors (parallel to team A)
- Using the consensus scores of team A and of team B a “final” score for each of the vendors (for each criterion) was reached

**Difference # 8: making use of two teams who each come to a consensus score, after which the final score for each vendor (on each criterion) is determined (again in consensus)**

A more significant difference regarding ranking was the way the actual ranking took place. In the original methodology, one of the options was to have relative ratings. In other words, each vendor scores a percentage of the highest performing vendor (on each criterion). This relative scoring is not allowed in The Netherlands: the rule of independence of irrelevant alternatives says that the relative ranking of two alternatives A and B must not be affected by a third alternative C.
Within European law contracts can be awarded either on the basis of lowest price or most economically advantageous tender (MEAT). Logically, the system of MEAT was chosen for the fast track program. When an award is going to be based on MEAT the suppliers must be reasonably informed on the award criteria and relative weighting that will be applied to the award criteria. Award criteria must be objective criteria to ensure compliance with the principles of transparency, non-discrimination, equal treatment and which guarantee tenders are assessed in conditions of effective competition. As mentioned before, award criteria were pricing, RAVA plans, schedule (planning) and interviews. Logically, these criteria were disclosed prior to the tender process.

In the Dutch infrastructure sector bigger public clients have adapted a specific way to combine price and quality into best value (PSI Bouw, 2007). All “quality” criteria are “transformed” into “fictitious” Euros. To calculate which vendor has the most economically advantageous tender, the amount of “fictitious” Euros scored on quality is deducted from the vendor’s budget. E.g.: for a € 100 million project, the maximum (fictitious) deduction is € 70 million (=70%). This would lead to a fictitious price for this vendor of € 30 million. For each criterion, a vendor could get a deduction on its price (when the grade on the quality criterion is more than a “6”) or there could be an addition to the price (when the grade on the quality criterion is lower than a “6”). See Table 2.

<table>
<thead>
<tr>
<th>Grade</th>
<th>% of maximum value</th>
</tr>
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<tbody>
<tr>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>8</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>25</td>
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<tr>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>-25</td>
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<tr>
<td>4</td>
<td>-50</td>
</tr>
<tr>
<td>3</td>
<td>-75</td>
</tr>
<tr>
<td>2</td>
<td>-100</td>
</tr>
</tbody>
</table>

E.g.: if RAVA plans counts for 20% in the ranking of a € 100 mln project, the maximum deduction (resulting from interviews) would be € 20 mln. A score of “7” on interviews would lead to a deduction of € 5 mln

Difference # 9: ranking the vendors based on their absolute scores (instead of the relative scores), and based on price +/- “deductions from quality scores”
Pre-award phase

The pre-award phase was done after the award. European legislation prohibits public clients to negotiate or have extensive clarification with vendors before the award. For this reason Rijkswaterstaat used the phase directly after the award as an “introduction phase”. This phase is set up exactly like the pre-award phase. At the end of this phase the contractor has a project management plan, a risk management plan which includes all the risks and concerns of the client and an overall schedule. Also the weekly risk report has been brought into place.

Difference # 10: the pre-award phase is carried out after the award.

Execution phase

A question Rijkswaterstaat had to face in the absence of a past performance system, was how the best value contractor could be incentivised to control risk he did not control after contract award. The solution was a so-called “risk fund”. This fund is filled with the predicted amount of € for the risks that are the responsibility of Rijkswaterstaat. During the execution of the project the contractor can propose measures for risk minimization. The money for these measures are paid out of the risk fund. Also risks that actually occur are paid from the risk fund. The contractor receives 25% of the remaining euros in the risk fund at the end of the project. This risk fund, combined with the weekly risk report, ensures that the contractor works in the best interest of the client.

Difference # 11: working with a risk fund

Results of the 6 clusters

All 6 clusters have been tendered and have started the design or construction phase. The goals of the procurement strategy were to accelerate the delivery and the length of the tender procedure, to maintain the competition and to procure the best possible value.

The first conclusion is that the procurement strategy has made the acceleration of the projects possible. All the tenders were executed within a period of five months, where a tender for this type of projects usually takes eight to ten months. The transaction time is cut in half. The early involvement of the vendors can accelerate the delivery of the projects up to 18 months. The focus on timely delivery of the projects lead to a proposals by the vendors for shortening the building period.

The number of vendors that participated in the six tenders was sufficient and comparable to the usual number for projects of this size. One of the most important findings of the market consultation was that there was a shortage in tender capacity in the infrastructure market in 2009. The risk for Rijkswaterstaat was that not enough vendors would want to bid for the projects of the Fast Track program. On average every tender has had 5 vendors bidding, with a minimum of 3 on one project and 6 on two projects.
The third goal of the procurement strategy was to achieve the best possible value for the projects. Figure 2 shows the results of the six tender for both the price and quality. As described in the previous sector the quality criteria were transformed into fictitious prices. The green part of the bars means that vendors have earned a deduction from their price based on positive scores for their quality. The red part of the bars depicts an addition to the price due to a negative score on quality aspects. In case of a deduction the offered price is the sum of the two green parts. In case of an addition the price is the green part of the bar. For instance: the winner (number 1) of the SAABA-A tender earned a deduction of 7 million Euro’s on his price of 37 million Euro’s for the quality of his offer. The resulting fictitious price is 29 million Euro’s and is the lowest fictitious price.

The figure illustrates that the quality aspects highly differentiate between the vendors. The figure also shows that in 50% of the tenders the vendor with the highest quality is also the winner. In the three other tenders the winner had the second or third quality score. This suggests that the procurement process has a bias to vendors with high quality (as expected and intended).
question is if this high quality means that Rijkswaterstaat pays a higher price. In 5 out of 6 tenders the lowest price is not the MEAT, the exception being package E. In 67% of the tenders, the second prioritized competitor in price is the MEAT. This means that quality and a sharp price seem to go hand in hand. The conclusion about price and budget however should be made at the end of the project, taking regard of all the change orders.

The interviews made up 20% of the ranking. The interviews were very differentiating. There were no problems in scoring different key persons. The free choice of the key persons by the vendors did not raise any problems. Another observation is that the individual consultation sessions during the tender sometimes led to attempts to verify chances of risks minimizing measures by the vendors. Not answering these questions was sometimes misunderstood by the vendors and led to allegations of non-transparency.

**Summary and conclusions**

Over the last years, PIPS tests have not only been done within the US, but also outside the US. Recently a number of (successful) tests have been done in the Netherlands (see the other papers in this Special Issue). Now, Rijkswaterstaat is using PIPS in its Fast Track project, making it the world’s largest PIPS pilot, worth circa $ 800M. In designing the tender process Rijkswaterstaat’s goal was to stay as close to the original PIPS methodology as possible. A few adaptations had to be made. In this paper 11 adaptations (mostly minor) to the original methodology are outlined. The philosophy when applying the adapted methodology however was still completely intact: it was aimed at finding the highest quality vendor within the budget (like in the original methodology as developed by Dean Kashiwagi).

The results of the six clusters have been promising: when setting up a tender process using Best Value Procurement acceleration in the delivery of projects was made possible, the competition was maintained and high quality and a sharp price went hand-in-hand. Of course the best value vendors will have to show their expertise during the design and realization phase.

The outlook is bright; Rijkswaterstaat is currently contemplating applying the principles in new projects (outside the fast track projects).

**References**

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