

BUILDING AN ASSET MANAGEMENT ORGANIZATION FROM ZERO BASE TO GOING CONCERN IN 2.5 YEARS – CASE STUDY

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Abstract

This article explains why a Dutch regional Legal Authority for public transport, BRU, took the decision to take matter in its own hands and became an Asset Manager. It highlights the implementation stages; the chosen asset management model on strategical, tactical and operational level; the implemented asset management processes, systems and procedures; gaining maturity level; and learning points.

1 Introduction

Bestuur Regio Utrecht (BRU) is a partnership of nine towns around the city of Utrecht, the fourth city of The Netherlands (311,000 inhabitants). BRU is the Legal Authority for public transport (bus and tram) in this region. The tram system of BRU, between Utrecht and its satellite cities Nieuwegein and IJsselstein (the so-called SUNIJ-line), is one of the most important public transport connections in this region. Daily, 40,000 passengers are using the tramway. The SUNIJ-line started operations in 1983 and is now almost 28 years old. The SUNIJ-line includes 45 trams in operation (2 different series, see figure 1), 23km rail track (standard gauge, segregated tramway), 25 stations and a depot in Nieuwegein.



Figure 1: Rotax tram and SIG-tram (source: BRU)

The fleet consists of 27 high floor articulated trams built by SIG in 1982 and 18 trams (motored high floor trams and trailers) bought from Wiener Linien in 2008 and built by Rotax between 1980 and 1990. Both types are bi-directional and are powered overhead by a 750V DC supply.

The SIG trams operate the main service between 5:30 AM and 1:00 AM and the Rotax trams operate the weekday peak time limited services only. On weekdays for the morning peak service 24 SIG trams are required and after peak time 20 SIG trams; for the peak services 12 Rotax trams are needed. SIG trams mostly operate in coupled pairs and Rotax trams operate in a train of 2 motored trams and 1 trailer.

2008 is a landmark date for BRU. Until then, the concession holder Connexxion owned the rolling stock, stations and depot. The rail infrastructure was managed by the Dutch mainline network operator ProRail. For several reasons (which will be explained further on) BRU has decided to take matter in its own hands: BRU became Asset Owner and Asset Manager of the rolling stock, stations, depot and rail infrastructure. All maintenance is being outsourced to contractors.

In a complex environment, BRU has built a fully equipped lean & mean Asset Management organization in 2.5 years time. From a Greenfield situation in 2008 (with a tramway in full operation!) to a going concern phase in December 2010: an exciting and unique project with a fast learning curve.

2 How it all started

BRU is a relatively small governing body under direct administrative control of the connected municipalities. BRU by law is the concession provider for public transport in its region: taxi, bus and tram (SUNIJ-line). Approximately 70% of all funds is related to public transport.

The dramatic decision of the Board of BRU to become Asset Owner & Asset Manager of the SUNIJ-line was based on:

- The necessity to create a level playing field for the new concession;
- The policy of Dutch Government to hand over regional rail infrastructure to regional government;
- The hustle and bustle in the morning and afternoon peak hours and the expected increase in passenger numbers the next few years.

These major developments are further explained below.

2.1 Level playing field

BRU wanted to create a level playing field at the start of the new concession period in December 2008. Until then, Connexxion owned the fleet of SIG-trams, stations and depot in Nieuwegein. This would potentially limit the competition. If Connexxion would lose the concession they would face the risk of being left with rolling stock and a depot they could not use any more. In 2008 both parties reached an agreement to hand over rolling stock in 2008 and the depot in 2009.

2.2 Policy regarding regional railinfrastructure

The Dutch Government legally owned the main rail and regional rail links. Since the beginning of the SUNIJ-line, the Dutch mainline network operator ProRail managed the rail infrastructure. In the nineties, Dutch Government made the first move in transferring ownership of regional rail and tram connections to the regional authorities, including funding, because the regional authorities are expected to be in a better position to manage these assets properly.

In 2008, BRU and ProRail started an intensive project to hand over the rail infrastructure of the SUNIJ-line “as is”, knowing that the rail infrastructure was in a bad state. Important aspects to manage were:

- Baseline assessment by third party;
- Determine what information (static and variable data) will be handed over at what moment and in what format;
- Transfer of existing maintenance contract to keep continuity;
- Agreement on outstanding issues, e.g. power switching of the overhead lines, incident reporting and ongoing projects;
- Building an Asset Register and getting it on-line;
- Implementation of a Safety Management system and approval by an independent safety assessor.

This project had a much longer duration (2 years) than expected, mainly because of a not well executed baseline assessment, a laborious relationship between ProRail and BRU and additional requirements regarding the safety management system by the Supervisory Safety Authority. Finally, all parties agreed that the rail infrastructure was handed over in December 2010 with the current “as is” (bad) condition and a “standstill” principle regarding safety.

2.3 Increasing traffic

As stated earlier, the SUNIJ-line is a busy tramway. In 2007-2008 it became clear that on short notice additional services were needed during peak hour services. Buying new trams was not an option, because of the relatively small amount of trams needed and the urgency. BRU found an opportunity to buy 18 used trams suitable to use on the SUNIJ-system. Wiener Linien, the public transport company of Vienna, was phasing out their Rotax trams of E6 series (motored trams) and C6 series (trailers). In 2 years time, the Rotax trams were made ready for service and approval by the Supervisory Safety Authority.

2.4 Other influencing factors

Apart from the above mentioned major developments, other factors were influencing the decisions of the Board regarding ownership and Asset Management:

- Ambition of BRU: a extensive tram network of 5 tramlines in 2025/2040;
- Terms of Reference for the future tram network;
- A new extension of the tram system from Utrecht Central Station to the Utrecht University complex (Uithof-line). Construction will start in 2013 and planned operation is from 2018;
- An introduction of low floor articulated trams between 2015 and 2018, first to operate on the new Uithof-line, later (2018-2023) to replace the existing fleet of Rotax and SIG trams;
- Refurbishment of the current fleet of SIG-trams (2011-2013), so that these trams are able to operate until their scheduled replacement between 2018 and 2023;
- Large overhaul of the rail infrastructure (Northern part) between 2012 and 2014. The two Southern branches will be overhauled in 2018-2019;
- The construction of a new depot (2012-2015) to modernize the current facilities and accommodate the new trams;
- The terminal complex of Utrecht Central station is being re-constructed fully between 2010 and 2014.

There were so many project interfaces to manage that BRU decided to take matter in its own hands to control the numerous risks they faced. That led to the dramatic decision in 2008 to take over the ownership and management of all tram related assets of the SUNIJ-line.

In the first year (2009), a temporary Asset Management project organization was set up, which main task was to guarantee continuity and prepare a definitive organization. In 2010, the Board decided on the management model and its related (permanent) organization. See section 3.

3 Asset Management Model

As a concession provider and asset owner, BRU has a number of resulting responsibilities, for which processes and key persons must be appointed:

- Principal responsibility;
- Financial responsibility and transparency;
- Policymaking;
- Legal responsibility and liability.

These responsibilities are preconditions for the choices BRU has in organizing asset management at strategic, tactical and operational level. Certainly, BRU as a policy focused organization does not want to carry out operational maintenance activities itself. Of course, BRU should act at strategic level (e.g. visioning, choices on new equipment, line choice, etc.) in any case. In an external accompanied route BRU management has made a choice from four available management models, given in figure 2.

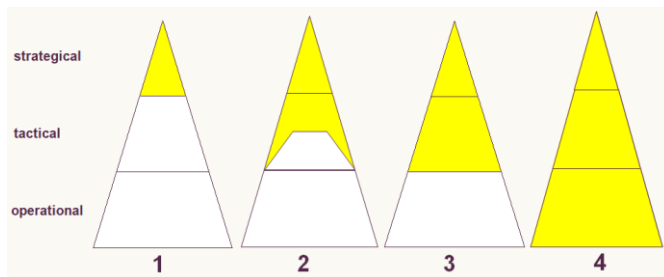


Figure 2: Asset Management models (source: I.E.S. Asset Management / BRU)

Model 4 is “old school”, where all tasks at strategical, tactical and operational levels are carried out by the client himself as much as possible. In model 3 all operational maintenance tasks are being outsourced to one or more third party contractors and this model has a full-size in-house Asset Manager function.

In model 1 only the strategical tasks remain with the client (including contract management); all other tasks on tactical and operational level are outsourced to one main contractor or, as a variant, to a managing agent on tactical level and one or more third party contractors on operational level.

Model 2 is in between model 1 and 3, meaning that the client executes the Asset Manager function in outline at tactical level and outsources all operational management tasks at tactical level (such as Permit To Work (PTW) issuance, incident management, specialized inspection & monitoring, maintenance engineering) to third party contractors. All operational maintenance tasks are being outsourced to one or more third party contractors.

To be able to make a well-founded choice for a management model, BRU used the following criteria:

- Public administrative considerations

- Political and public administrative responsibility;
- BRU is policy oriented and not an operational oriented organization;
- Professional principal contract management
 - Contract management;
 - Interface management;
 - Knowledge management;
- Control
 - Influence and impact on safety, quality and lifecycle management;
 - Risk management;
 - Future resistance (secured in future).

BRU has finally opted for management model 2: executing the asset manager function in outline at tactical level. The main reason for this choice is that with model 2 BRU is able to control all interfaces correctly. Processes such as contract management, maintenance concept, long-term planning, configuration management and interface management are of key importance to BRU to be in control. This is therefore not left to a managing agent or a third party contractor.

By executing or directing those activities itself in the coming years, BRU will also gain experience, which may be useful later to improve the management model. As outsourcing operational management tasks on a tactical level to third party contractors is maximized, model 2 fits well within the political and public administrative environment.

Finally, BRU has planned to evaluate the current decision for model 2 in 2015-2016, so further outsourcing decisions (if any) will be taken from that point.

4 Implementation of Asset Management processes

As a starting point for implementation, BRU developed an Asset Management process model, that was based on an existing model, jointly developed by I.E.S. Asset Management and Amsterdam Airport Schiphol. The process model is fully BSI PAS 55:2008 compliant.

Figure 3 shows the most relevant Asset Management processes on 4 levels: policy level (ambition, tram network 2025/2040, etc.); strategical level (asset strategy, asset management plan); tactical level (maintenance concept, long term maintenance & investment planning, configuration management, performance & contract management, etc.); and operational level (maintenance execution, operations). Supporting processes are continuous improvement activities, information management and risk management. The processes have been created around the best practices derived from BSI PAS 55:2008 and when applied, the organisation is able to comply to regulations and is ready to realise proper system effectiveness meeting ROI standards in a cost effective way.

The next sections give some examples to illustrate how the

organisation and Asset Management processes were created and what results have been achieved after 2.5 years.

4.1 Organization

In the first year, BRU started with the immediate launch of a lean & mean Asset Management project organization, with major delegated responsibilities and short decision lines. Characteristic is that all employees are hired externally and selected for their high degree of professionalism, proven experience and team spirit. Attracting external specialists has the advantage of having immediate knowledge and expertise on board, and thus the project could gain speed very quickly. This was necessary because the process continuity had to be secured directly from the beginning.

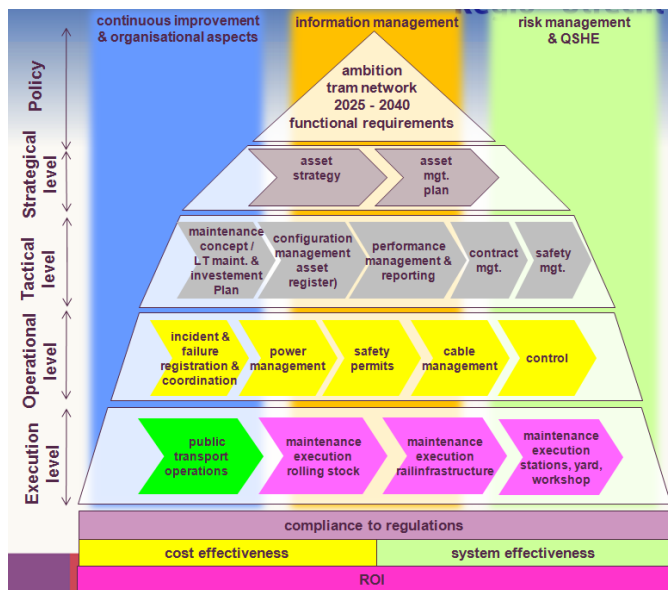


Figure 3: Asset Management process model (source: I.E.S. Asset Management / BRU)

The Asset Management organization consists of a manager Asset & Maintenance Management; three Asset Managers (rail infrastructure, rolling stock and stations/depot); secretary; configuration librarian; and two supervisors. In total, the Asset Management organization has 8 FTE. This team is supported by an external group of technical specialists who are hired for specific (part time) tasks. Apart from the Asset Management organization BRU appointed also a safety manager and a small project & development department.

As soon as the Board of BRU had decided on the management model the temporarily project organization was easily changed into a permanent Asset Management organization. Many hired external employees wanted to be employed on a permanent basis with BRU or longer-term secondment contracts (interesting for both parties) could be arranged. In order not to overload the Asset Management organization all projects (e.g. refurbishment SIG-trams, large overhaul rail infrastructure) are manned with external project managers and project employees, who represent and are controlled by the respective Asset Managers.

4.2 Process implementation highlights

From the beginning, BRU had an organic approach in implementing the Asset Management processes, which you could characterize with "the jig saw puzzle approach": firstly, create a framework and secondly, add group wise each missing element in a state of the art way.

BRUs biggest concern was to eliminate overdue maintenance of their predecessors and guaranteeing continuity. A basic organization with only essential systems, procedures and directions had to be set up quickly to implement Asset Management processes in order to secure safety and continuity of exploitation.

The Asset Management process model was used as a framework for implementation. In this model all best practices and guidance from PAS 55-2:2008 [1] are incorporated, which gave BRU the opportunity to implement processes and practices immediately in a state of the art way. BRU was of course lucky to be in a Greenfield situation: no Asset Management processes had been arranged when BRU started in December 2008. This is often not the case in longstanding organizations.

When it became opportune that some important elements were missing, BRU improved or extended existing processes or practices or added new ones. In this stage there is less focus on the long term and more focus on the short and medium term until a more stable phase has been reached. In the stable phase, there is ample time and energy for reflection and future planning.

The key elements BRU has quickly and thoroughly implemented are:

Technical documentation.

The documentation provided by the predecessors was mostly on paper only, incomplete and not actual. It took more than two years lead time to get it right: digitize, classify and structure in an accessible structure and made manageable by using configuration management procedures.

Configuration management.

An Asset Manager has to know what assets he manages, in what condition they are and if the condition is quite poor, what mitigating measures must be taken.

In view of the impending transfer of the rail infrastructure in 2010, a lot of time was spent on establishing configuration management guidelines & procedures and a Change Control Board that assesses all (functional) changes in documentation and assets. This makes it possible to control the daily changes in the operational process and to secure the integrality and safety. Additionally, an asset register for rail infrastructure and stations has been developed in a geo based environment. The asset register includes the location, relevant static information and the condition of the assets. Results of periodic inspections by BRU supervisors and possible

mitigating measures are recorded in the asset register, so that the information in the asset register remains actual. The asset register and technical documentation are managed by the configuration librarian.

Maintenance concept.

When BRU took over the maintenance concept of all assets from their predecessors and it was not clear on what grounds the concepts were based. Subsequently BRU prepared a risk-based maintenance concept for the rail assets. And because of the relatively good performance of the rolling stock BRU decided to update the existing maintenance concept only (which is not risk-based yet). In 2012 the maintenance concept of the rolling stock will be thoroughly addressed.

Safety management.

One condition for handing over the rail infrastructure to BRU was the implementation of a safety management system. This was a good opportunity for BRU to use this as a crowbar to set up in a relatively short time (one year) an Asset Management organization structurally supported with guidelines, process descriptions, procedures and instructions. For that purpose a trainee was hired to compose and write these documents under supervision of the Safety Manager. Part of the system is an actively managed hazard & incident log and a project & process risk analysis system. Supporting the safety management system was not only the aforementioned configuration management process and asset register, but also the operational tasks at tactical level by third parties.

Management tasks on operational level.

In a lean and mean Asset Management organization at tactical level the execution of operational management tasks does not fit really well. BRU was therefore forced to outsource tasks like Permit To Work (PTW) issuance, incident management, specialized inspection & monitoring, maintenance engineering to third parties. The various parties are controlled by the Asset Managers of BRU. So far, BRU has had good experience with outsourcing these tasks to third parties. However, managing the interfaces is of key importance in this respect.

Contract management.

When BRU became Asset Owner in the period 2008-2010 the existing contracts with third party contractors were inherited from the predecessors. That gave BRU enough time to prepare new tenders and to decide whether some maintenance activities could be combined in one contract. The first two years BRU focused on closing basic contracts (time & materials or basic SLAs) with short contract duration, so that combined with a watchful eye BRU got control of the situation outside very rapidly and was able to manage the quality, availability, cleanliness and costs of the assets. After more than 25 years working in the same way without strict control, a weak safety and performance culture had been developed. By means of strict supervision it became readily apparent who was in charge and the "bad actors" could be identified and removed within two years. The situation is now

stable enough (for both BRU and its contractors) to be able to put out innovative performance contracts. An example: The maintenance of rolling stock is contracted in accordance with the Best Value Procurement (BVP) methodology in Q4/2011 with a contract duration of 8 years.

Performance management.

The inherited contracts hardly provided any performance information. In new contracts a limited set of performance indicators is agreed upon, matching the contract type. In 2011 BRU developed a regular monthly report for both internal and external stakeholders, based on information provided by our contractors in separate reports. BRU plans to implement in 2012 a dashboard on top of the various maintenance information systems that its contractors work with, to give BRU online insight into the asset performance.

Asset Management Plan.

In Q3/2011 BRU finally has published its first Asset Management Plan, including the Asset Management Policy and Asset Management Strategy based on the results of an assessment of the process maturity (see paragraph 4.3). The Asset Management Plan was inspired by the published Asset Management plan of Network Rail [2],[3], which is to the opinion of BRU a good example of a coherent and easy to read Asset Management Plan. The AMP will guide BRU through the next 5 years.

4.3 Current state maturity asset management processes

In mid-2011, BRU assessed the current state of a set of key Asset Management processes, as shown in figure 4, such as: strategy management (#1), performance management (#2), configuration management (#3), maintenance concept (#4), engineering (#5), financial management (#6), procurement (#8), contract management (#9), information management (#11), continuous improvement (#12), organization (#13) and risk management & SHE (#14). BRU used the assessment methodology Asset Management workbench® of I.E.S. [4]. This assessment is fully PAS 55 compliant and can be used to perform a gap analysis in improvement and (pre)certification courses.

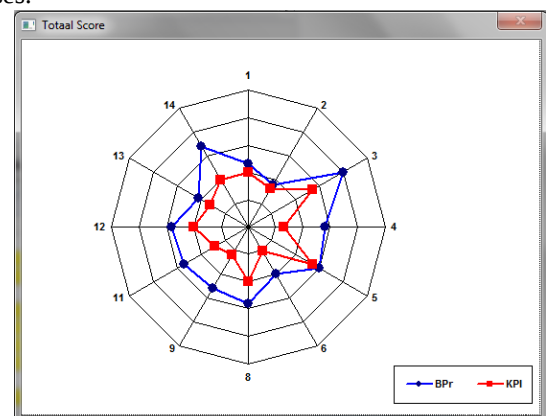


Figure 4: Results of a gap-analysis with the Asset Management workbench® (source: BRU)

The main conclusion of the assessment is that after 2.5 years, the current Asset management processes and organization are at an average level (3 out of 5). Configuration management (#3) and risk management & SHE (#14) are more than average (level 4 out of 5). Some improvement points in order to rise to maturity level 4 (out of 5) are:

- performance management (measure and report);
- financial control;
- quantitative analysis of maintenance concepts;
- task and responsibilities of Asset Owner, Asset Managers, Asset User and Service Providers should be defined more clearly;
- asset register rolling stock & depot;
- contractor compliance to specific regulations;
- contingency planning;
- configuration management for rolling stock;
- vendor rating.

When these elements have improved to level 4 BRU is able to prepare for PAS-55 certification.

5 Lessons learned

In this unique and exciting project we had moments of joy, because we had made the right choices or things had worked out tremendously well. And we made mistakes too.

Some lessons learned:

- Eliminate overdue maintenance quickly to enhance the motivation of the drivers and passengers. This results in better quality of failure reporting and less pollution and vandalism in the stations;
- Use academic trainees. They are smart, work hard and are relatively cheap labour. Our trainees helped us through the tough times;
- The “jigsaw puzzle approach” works well in a relative instable phase of a project;
- Use the implementation of a safety or quality management system as a crowbar to get things done;
- Strict supervision of the maintenance execution by your contractors will allow you as a principal organization to get control of the situation outside very rapidly, so that you are able to manage the quality, availability, cleanliness and costs of the assets. Further, it gives you insight whether your safety management system, directions, procedures and instructions work properly. Our experience is that the strict supervision can be liberated when you have removed all ‘bad actors’ and selected honest ‘good actors’. However, a watchful eye remains necessary, even when you have performance contracts.
- A lean & mean project team with external support can realize a huge amount of work in short time. Ensure that their knowledge and experience is recorded in memos, procedures and directions.
- Watch out for implicit decision making. Precisely because of the workload and operational character of

the Asset Management processes, decisions are often implicitly taken. Afterwards nobody knows anymore what has been decided by whom and why. We used memos in an extensive way to record all decisions: from reasons why we chose to outsource specific activities via decisions on specific scenarios to recording the results of a tendering procedure. Although it was not the most popular thing to do, in the end it became a habit.

- We had a small management team (Kernal) who was in charge of all major decisions. In this way, we were able to secure the integrity of our decisions.
- An Asset Manager really benefits from a proper asset register. It takes some time before you have it, but it gives a lot of insight and you’re really in control.
- We were sadly disappointed numerous times by the lack of knowledge and experience of contractors with Asset Management. We found out that only a few contractors were really ready for performance contracts.
- Financial control is of key importance to prevent unpleasant surprises. The financial process and information system of BRU was not suitable to handle the enormous flow of invoices which started in the first week of 2009 (and never stopped again). This led to stiff handling, long lead times, overdue payments, misunderstandings and very limited insight in our financial state. After a while we hired our own project controller to clean up the mess and get into control of our day to day financial process. We do better now, so we learned, but it is still difficult to fit the financial operations of an Asset Management organization into a financial system of a policy making governmental organization.

6 Forward thinking

Looking back on almost three years of hard work with a new and small organization, we have achieved an impressive number of results, which many people thought impossible. And we are proud of it! However, there is still much to do. Processes have to be streamlined and improved. We must find time to execute our long term plans. Within three years from now we want to apply for a PAS 55 certification. So again, we use the crowbar to make sure that we do not recline.

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