

Bridging the gap – meeting the needs of PPP projects

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Abstract

PPP projects domestically and in the world will continue to become the primary method for the provision of major new transport (road) infrastructure. The two key protagonists involved in progressing such projects - the traffic modeller and the financial analyst are often at loggerheads yet it is vital that these two parties work constructively together to make much needed infrastructure happen and avoid the blame game.

Two such protagonist recently successfully worked together to deliver a major PPP project. Find out how.

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Paper

1. Introduction

Traditionally road projects are driven by certain groups at various stages of its development. At the concept and detailed design phase the highway design team leads with inputs from others but it is still an engineering focused outcome. Taking the project forward through the Business Case Phase, the economics or financial advisor teams plays the lead role. These teams often have had limited or no involvement in the engineering design phase even when undertaking cost estimates as they generally fall within the engineering design realm and the design teams are less focused at looking at the financial viability of the project, per se.

This disconnect in the different stages of the project development often leads to problems. Sometimes, the problems can be resolved but, at times, this approach could have serious implications that could lead to failed projects.

In terms of the aforementioned issues, toll road Public Private Partnerships (PPPs) led the pack. As is well known toll roads have a potted history, putting it mildly. The project fails financially shortly after opening. The blame game begins. The traffic modeller will claim that they are being unfairly treated and would argue the forecasts are just that and are as justifiable as the big numbers supported by pretty graphs produced by the financial team. The financial team would argue that more rigor should be applied and that the reason why the numbers don't add up is that the traffic forecasts were widely optimistic – to which the modeller counters that these numbers were requested to support the financial viability assessment at the outset to continue and build the project and so it continues. At the end of the day lawyers become involved and, no disrespect to lawyers, never a good position to get to.

For PPP's, which in various forms is likely to be the future road infrastructure delivery model, this traditional approach simply does not work. The key word here is partnership. We are not talking about all players engaging in group hugs and team building exercises such as shooting paint balls at each other (never understood how this was meant to breed team harmony!). Rather this is a shift in project management approach and perceptions of the players. This latter aspect will be a challenge in itself as humility is never a strong trait in the professional world, but it can work.

The example we talk about here is a recent PPP feasibility study we worked on in Bangladesh for the proposed 230 km Dhaka to Chittagong Expressway. At a cost of US\$3.5bn, this project is likely to be a largest tolled highway in Bangladesh and among the largest transactions in the World.

The project was far from perfect but in our 20+ years of working on road infrastructure projects this one demonstrated key facets of what could be achieved by working together in a constructive manner. What we try to advocate here is that there is an alternative approach based on project management team structure and the willingness of both parties to leave egos at home and engage in supportive integrated manner.

In this example we are looking at traffic modelling and financial assessment but this approach was true across all professions engaged on this project.

Stepping through this paper we will:

- Give a broad overview of what PPP is
- Provide overviews of the modelling and financial elements

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- Discuss what usually happen don such programs
- Identifying what happened on this project, what lessons learnt and how can this be repeated

2. Public Private Partnerships

PPPs are typically long-term contracts between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration, is linked to performance.

Public Private Partnerships have long been used internationally (particularly in Canada, the United Kingdom and Australia) and in a wide range of sectors, to provide many different kinds of assets and services. For example, in the UK, the entire urban water supply infrastructure is owned by the private sector and all three major London airports—Heathrow, Gatwick, and City Airport—are privately owned and operated. Privately managed highways are common in Canada, Australia and across Europe, particularly in Spain and Portugal. Similarly transit systems in several countries are privately financed and managed. The concept is also increasingly being adopted by emerging markets with some countries like India and the Philippines already developing a steady pipeline of PPPs particularly in the transport sector.

Most PPPs are project financed. This means lenders only have recourse to the cash flows generated by the PPP project (typically, a limited liability company incorporated specifically for the project) for their debt service. In contrast, corporate finance loans typically are secured against all cash flows generated by the borrower entity (for instance, a portfolio of toll roads) and may even demand counter guarantees from borrower's parent entity.

Since project cash flows are the only source for servicing debt, forecasting cash flows likely to be generated by the borrower is extremely critical to assess the feasibility and bankability of such projects. For PPPs, the level of complexity and uncertainty in forecasting depends on whether the borrower bears the revenue risk or not. If the borrower is not bearing revenue risk, the PPP structure is likely to include a stream of pre-defined cash flows from the government to the PPP concessionaire (which is typically the borrower). Examples of such structures include availability payments for roads or hospitals and 'take or pay' arrangements for power plants where the government pays the concessionaire pre-defined amount periodically so long as the concessionaire meets its performance requirements under the PPP.

For PPPs where revenue risk is transferred to the concessionaire, however, both borrowers and lenders will spend considerable time and costs trying to predict cash flows likely to be generated by the project especially over the life of the loan. This could involve forecasting toll collections for a highway, forecasting revenues from providing port terminal services to shipping lines, forecasting collections from providing drinking water and sewerage services, forecasting revenues from sale of power generated by a merchant power plant¹.

This paper focuses on traffic forecasting and related financing issues faced by the transport projects, particularly, toll roads.

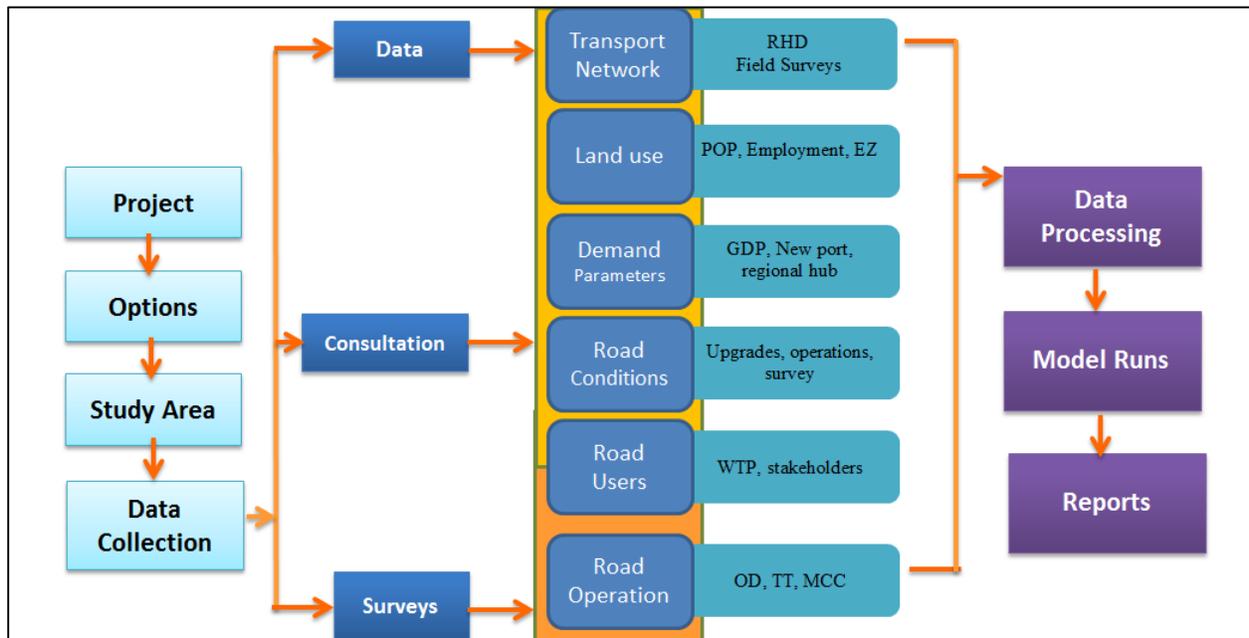
¹ Merchant Power Plants are those which don't have a fixed Power Purchase Agreement with the government and, consequently, sell energy produced in the open market typically through a bidding process

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3. Modelling Overview

Figure 1 below outlines the general steps in undertaking the modelling process. The aim of the traffic model is to reflect as accurately as possible current traffic conditions so that any future year forecasts can be viewed with a level of confidence as they are derived from a robust base model. This process of calibration and validation is achieved when traffic volumes at defined locations on the modelled road network are compared against actual observed counts collected from surveying at this location. If the differences between observed and modelled volumes are within industry accepted parameters, then the model can be viewed as fit for purpose. Therefore, collecting as much data over actual travel patterns and the drivers of these in terms of perceptions, economic demand, and land use patterns is crucial. For this study an extensive survey program is undertaken that allowed the traffic modeller to build a robust model

Figure 1 General Model Development Process



As figure 2 below shows how the traffic model provides inputs to several other disciplines. Apart from the financial model, the traffic model also provides inputs to the economic analysis, the road design, environment and social analysis.

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Figure 2 Model inputs and outputs - other disciplines



4. Finance Overview

A typical PPP project development process goes through four phases: First a project concept is developed; following this, a prefeasibility study is undertaken which is a high level assessment of project's viability; detailed project feasibility is undertaken if the project appears to be viable at the pre-feasibility phase; finally, the project is tendered (also called, the 'transaction' phase). At the tender stage, all bidders will undertake their own feasibility assessments. Project lenders may then require their own independent assessment before agreeing to finance the project during the transaction phase.

Assessing financial feasibility is integral to each phase of the project development process. The level of detail and efforts made to assess the viability increase with each subsequent phase. During the first phase (project concept development) the effort is limited to making some high level but realistic assumptions about availability of finance for the project. In subsequent stages, more efforts are made to assess the maximum level of debt the project can sustain (maximum leverage) and the terms of such debt (for instance, debt tenor, grace period, repayment structure, interest and fees). Large scale, sophisticated project financings also include debt from several sources and with different level of seniority². In such cases, debt

² Seniority indicates the order in which lenders are paid from the project cash flows. Senior debt is paid first followed by mezzanine debt and lastly junior debt.

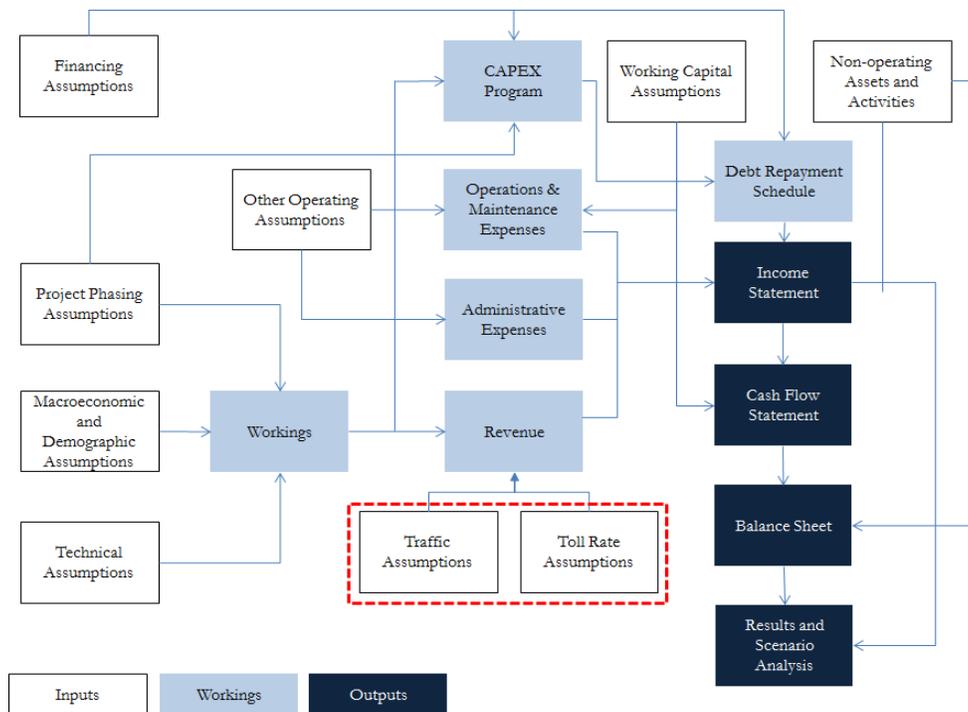
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structuring becomes an extremely complex task forming a large part of the financial feasibility assessment efforts, particularly during the transaction phase.

The PPP sponsors’ financial advisors typically build a financial model to assess financial feasibility of the project at the prefeasibility assessment stage. The model is quite high level at this stage but gets progressively detailed and complex at the feasibility and transaction phases. Inputs to the financial model include cost and revenue forecasts, financing and other general assumptions like inflation and foreign exchange rates. Outputs of the model include project cash flows, financial feasibility ratios (like Debt Service Coverage Ratio³) and financial statements.

Figure 3 below shows a schematic of a financial model for a typical toll road:

Figure 2 Financial Model inputs and outputs



As mentioned above, the model building process is led by sponsor’s financial advisors at each phase of the project development process. During the transaction phase, lenders will also hire an independent advisor to review the financial model and its underlying inputs and assumptions. The model will also be audited by an independent auditor for structural integrity and tax and accounting assumptions.

During loan negotiations, several commercial clauses are negotiated ‘off the model’ which means that the model results under the terms being negotiated will often drive the final agreed terms. For instance, if a

³ DSCR compares project cash flows with its debt service obligations to assess if the project will generate sufficient cash flows to meet its interest and principal payment commitments. A project should, at the minimum, have a DSCR of 1X but in most cases, lenders require DSCR of 1.2X or higher

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lender requests a shorter grace period but the model shows that the project is unlikely to generate sufficient cash flows in the initial years of operation, the lender may agree to a longer grace period.

5. The protagonists – what usually happens

PPP feasibility assessments and transactions are typically undertaken by a consortium of advisory firms hired by the project sponsor (typically, the line ministry or a centralized PPP authority for the jurisdiction). Advisory consortiums include a wide range of specialists such as the technical (engineering) advisor, the financial advisor and a legal advisor. Further, specialist advisors may also be hired for niche areas such as accounting, tax and insurance.

The financial advisor develops the financial model, advises on risk allocation and structures the project financing. The technical advisor identifies technical risks, develops the conceptual design, estimates project costs and develops traffic and revenue (T&R) forecasts (the engineering firm and the T&R firm could be separate as well). The legal advisor assesses the legal viability, helps with project structuring and drafts transaction documentation.

There is a strong interdependence between the financial advisor and the T&R advisor roles. The financial advisor gives instructions on what it needs in terms of forecasts to the T&R advisor, which then develops forecasts. The financial advisor then runs its financial model using those forecasts. Depending on the model results, the financial advisor then requests the T&R advisor to run other forecasts with different variables which, in turn, help drive the overall feasibility assessment and project structuring.

In reality, the matters are not that straightforward. The relationship between these groups is often fragmented or tenuous at best. The traffic and financial models are developed in isolation and are only forced together at the final project feasibility reporting stage where expectations on outcomes are not met and the blame game occurs. Conflicts often arise between the two teams on issues such as (1) the level of efforts and costs to be incurred for a T&R study (2) which sensitivities to consider, and (3) timing for model runs, and (4) reliability of model results and (4) avenues to improve model results.

Two factors drive most of these conflicts—different incentives driving the two teams and lack of knowledge about the subject matter of the other team.

- **Different Incentives:** On transaction advisory mandates, financial advisory firms often receive a large share of their remuneration based on success i.e. when the transaction reaches financial close. This means that financial advisors are incentivized to successfully close the deal. In such cases, whenever traffic forecasts are not robust enough to make the project viable, the financial advisor may pressure the T&R advisor to somehow improve the results.

The T&R advisor, on the other hand, would resist this approach since they would like to be cautious rather than optimistic with traffic forecasts. This is understandable because there have been several cases in the recent past where project sponsors have sued T&R firms when actual traffic numbers turned out to be substantially lower than projections leading to bankruptcies⁴.

These incentives are part driven by the way such projects are set up. The project TOR is often structured with topic specific TOR's. The consultant therefore will focus on meeting the terms of

⁴ For instance, AECOM had to pay 280 million Australian dollars to settle a major lawsuit over its forecasts for the RiverCity toll road project

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reference to which their budget is tied to. There is no incentive to step outside of these TOR to address any other issues.

- **Lack of subject matter knowledge of the other team:** Financial advisory firms are typically investment banks, accounting firms or boutique firms led by experts who have previously worked with such banks or accounting firms. They are generally not economists and, therefore, do not understand the process, challenges and level of efforts required to develop traffic forecasts. For instance, financial advisors often fail to understand that toll revenue forecasts are not calculated at the end by simply looking at multiplying volumes by toll rates. The process behind generating the revenue forecasts has to be an integral one where not only do the traffic model outputs come in a form and from a clearly articulated methodology but the parameters that influence these–tolling regimes, growth rates have been developed in unison.

Further, modellers on the team are typically junior analysts who have limited practical exposure to other fields of study. For them, traffic forecasts are just one of the inputs they need to develop the financial model. T&R advisors, on the other hand, often do not understand the debt structuring and arranging process.

This lack of understanding about the other discipline often leads to unrealistic demands on when the forecasts can be delivered and types of sensitivity runs possible. This problem is often exacerbated as more entities get involved in the debt arranging process. For instance, a new bank may join the lender’s club and want to run additional sensitivities for their credit appraisal within a very short time.

The above two basic reasons for discord between the two teams are exacerbated by other factors like lack of communication and insufficient budgets.

- **Lack of Communication between teams:** For deals in emerging markets in particular, it is quite possible that both financial advisory teams and T&R teams are based in different countries and time zones. They also do not communicate regularly and, hence, are unable to develop a healthy working relationship.
- **Insufficient budget for T&R assessment:** Most transaction advisory mandates are awarded on a fixed fee basis. Due to this the financial advisory firm (which leads the consortium) may be encouraged to spend the minimum possible on sub-contractors including T&R advisors. This means that the T&R may not have enough resources to conduct a detailed T&R assessment leading to data gaps and lack of solid primary data backing the forecasts. Lack of sufficient budget makes traffic forecasting particularly challenging in emerging markets where almost all data needs primary research

Note that the above issues are not unique to the relationship between the financial advisor and T&R advisor. The financial advisor is likely to face the same issue with the engineering firm developing conceptual designs and cost estimates or with other sub-contractors. However, the disconnect between the financial advisor and the T&R advisor has more serious implications on the success or failure of the transaction compared to other advisors.

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6. The Bangladesh example – how it worked pros/cons/learnings

The case example, the Bangladesh Dhaka to Chittagong Expressway PPP project was one when the above issues were addressed. The feasibility study was undertaken over almost one year from August 2014 to June 2015. The results were presented by both the financial and T&R advisor to the client and both parties were in complete sync on the results of the study and the rationale behind them. This cohesiveness was reflected generally in the quality of the analysis. The constructive relationship also helped the team to submit the study on time and without any budget overruns. We explain below how this worked.

Some of the key principles of engagement following on the assignment were:

- **Constant Communication:** Through the course of the engagement, both the financial and traffic advisor were in constant touch with each other. This was not simply a case of assembling the team in one place and sitting together, although a number of projects are run this way on the assumption that new technology around video conferences and data portals will suffice by themselves. Rather the emphasis was on developing an all of project work plan with timed and costed linkages across the groups. Work programs were intertwined to avoid a common outcome where the first time the financial advisor sees the traffic data is when the final report lands on their desk. The following flow of events shows how the two workstreams were interwoven.

August 2014	<ul style="list-style-type: none"> ▪ Background research and initial discussions between the financial advisor and T&R advisor
September 2014	<ul style="list-style-type: none"> ▪ Both advisors had detailed discussion on the project viability and expectations from the T&R study. Both advisors were working in the same office for several weeks that facilitated constant engagement. ▪ Each group gave presentations to the team explaining their process, outcomes and timeframes.
October 2014	<ul style="list-style-type: none"> ▪ T&R study scoped out and planned. The financial advisor was consulted in the scoping the T&R study, hiring a local survey firm and designing the survey methodology and questionnaire. ▪ The financial advisor also provided guidance on the format in which they would need inputs from the T&R advisor and the sensitivities they would like to run.
November 2014- February 2015	<ul style="list-style-type: none"> ▪ T&R Study conducted and traffic model developed. ▪ Both advisors agreed the sensitivities that will need to be run in the T&R model. The advisors also discussed the project development and expansion timelines (i.e. when will construction finish? When should additional lanes be constructed? How should the competing road be treated?) ▪ The financial advisor developed the financial model in parallel. The advisor provided the format in which they would need the results from the T&R model for the financial analysis
March 2015- April 2015	<ul style="list-style-type: none"> ▪ Financial advisor assessed the financial feasibility based on the T&R results and discussed the results with the team

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May 2015	<ul style="list-style-type: none"> ▪ Final feasibility study submitted to the client
June 2015	<ul style="list-style-type: none"> ▪ Results presented to the client in a workshop jointly by the T&R advisor and the financial advisor

As the table above shows, there was constant engagement and communication between the T&R advisor and the financial advisor that enabled both parties to understand the others' needs, constraints and to appreciate the level of effort and time required to complete their tasks.

- **Knowledge Sharing:** Constant engagement between the two advisors facilitated sharing of knowledge between the two experts. The T&R advisor was able to explain the approach to the study and the interdependencies among different input assumptions to the financial advisor. The financial advisor, on the other hand, explained how the T&R results will affect the financial feasibility study and their ultimate impact on level of viability gap funding required from the government for the project. Both experts were, therefore, clear about the impact of their work on each other's workstreams. Both experts also understood what information is required and by when to ensure that both workstreams progress as planned.
- **Similar incentives:** Unlike other assignments where the project sponsors often combine the feasibility study and transaction advisory, the feasibility study mandate under this transaction was separated from the transaction design and bid process management. This meant the financial advisory fees were fixed and did not have any success fee component. Due to this, there was no incentive for the financial advisor to seek to pressure the T&R advisor to improve results even if the project was unviable under the forecasts generated.
- **Project Management Structure.** As described above, the project plan was set up so that disciplines do not operate in silos but are interdependent in their development phase so we get no surprise outcomes. For toll roads the key driver is of course toll revenue. Currently, this is addressed towards the end of the project when many of the input parameters have been fixed into the whole of project design. Relatively blunt instruments of fixed toll rates growing by time; low, medium, high growth options are fine for identifying the relative merits of various corridors but for supporting investment level decision making the financial and traffic model need to talk to each other from day one

In this case study there were examples of the good and not so good aspects

- **Good**
 - **Personnel.** The assembled team had a proven track record not just in the delivery of similar such projects but in a collaborative approach to working with other disciplines. As stated in the paper this proposed new approach must start with the correct mentality of the team players. The success of the proposed new approach will be undermined if there is not a real willingness and commitment to actively engage and learn about the other teams needs and work methods.
 - **Project management style and structure.** The approach adopted here encouraged section leads to work together and the assembled personnel had the correct mindset to utilise this opportunity.
 - **Work environment.** Although projects inputs varied by time of requirements by discipline leads which meant we could not always be on site at the project office every effort was

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made to integrate team members both physically but also across knowledge sharing through regular exchange of project information

- **Roles and responsibilities – integration and incentives.** At project set up the work program made it clear what each discipline was required to deliver and the inter-relationship between disciplines. There was an incentive to deliver that supported other disciplines rather than just do ‘your own thing’ in isolation of consequences of poor or late delivery.
- **Not so good**
 - **Terms of Reference (TOR)** – the project tasks were defined by a subject matter TOR with limited formal integration. This so called traditional approach in effect encourages the other disciplines to adopt the silo approach.
 - **Project Program.** The project was not offered to market as a complete beginning to end package so the continuity benefits of one team could and were lost
 - **Value capture.** This new approach encouraged innovative thinking that the traditional project tendering and delivery process did not allow this to be fully captured.

7. Where to now - making this best practice

The process outlined here could be dismissed by some as simply you need to speak and be nice to each other. However, this misses the point. The key attributes are a defined integrated process and a willingness of both parties to fully engage in this.

In terms of process we do not advocate a user manual. The point here is around flexibility to meet the project characteristics but within a framework of operational steps. Importantly, this is set up at project inception so each party clearly can see their role and responsibilities within the big picture of the project and not be solely focused on their perceived and actual terms of reference. No discipline acts in isolation or of higher importance than the other.

The primary challenge will be altering the mind sets of the protagonists to this new way of thinking. As with most things demonstrable proof that this process works will be a key step in convincing people to adopt this.

This change in approach is not just the consultant side but also needs to be undertaken on the client side to best to capture the benefits.

The next steps.

As with any new process there is often an inertia to change and a need to prove that this works. Through mediums such as this we hope to further document the framework process and report on the case study where this was implicitly applied and the reportable outcomes.

Building upon this framework further implement the process on other projects with reportable KPI's and an independent peer review. Through time improvement can be achieved.