

MWH AND THE FIJI ROADS AUTHORITY: A COLLABORATIVE APPROACH TO ASSET RENEWALS

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Abstract

Fiji is facing comparable problems to many areas of New Zealand; an increasing demand for services combined with an aging infrastructure that requires significant capital investment.

The Fiji Roads Authority (FRA) are undertaking upgrades of main arterial roads in Suva and Nadi, Fiji. These are also the main utility service corridors for water and wastewater infrastructure, as well as power and telecommunications.

The FRA and MWH New Zealand Ltd, the designer, adopted a collaborative approach, with utility operators invited to undertake upgrade and renewal works as part of the roading upgrades. The works are already under construction with the majority expected to be completed within the next two years.

Several benefits are being realised during these works including; renewal and upgrade of infrastructure at a reduced cost, co-ordination of utility corridors and the enhanced working relationships between the FRA and utility operators. Conversely, there are many challenges also being encountered, including the coordination and communication between multiple stakeholders and the scale of the project (in size and cost) in Fiji.

This paper demonstrates the benefits realised when a collaborative effort by utility operators is adopted and also identifies challenges that are likely to be encountered when undertaking a joint approach to renewal works. The potential application of this approach in the New Zealand context is also discussed.

Keywords: collaborative, asset renewal, utility operator, corridor manager, FRA

Introduction

Utility operators around the world are facing increasingly large asset renewals bills due to aging infrastructure and increased demand.

Roads as well as being the primary access routes for cars, public transport and pedestrians and cyclists, are also major utility service corridors. Consequently large scale works in the roading corridor can have significant impact on existing utilities and vice versa.

This paper explores the collaborative approach to asset renewals adopted in the Nadi and Suva Road Upgrade Project (NASRUP) in Fiji and discusses the challenges encountered, benefits realised and key lessons learnt. The paper also

looks at how this collaborative approach could be applied in the New Zealand context.

A collaborative approach to asset renewals requires utility operators and corridor managers to adapt their traditional renewal methods. This change of mindset has the potential to allow for innovations in design and construction and ultimately allow all utility operators to flourish.

Project Overview of NASRUP

NASRUP involves the upgrade of several arterial roads in Nadi and Suva, Fiji including the widening of some roads from two to four lanes, the installation of footpaths and bus stops and also the renewal of utilities both above and below ground. The project is part of the Fiji Roads Authority (FRA) ongoing capital programme of

works. Approximately 21km of roads are being upgraded under five contracts with the capital cost for the project estimated at over \$FJ350million, (approximately \$NZ250 million).



Figure 1 – Map of Fiji showing locations of Nadi and Suva

MWH Global as the FRA’s Principal Professional Engineering Services Adviser has undertaken the design, Engineer to the Contract and construction monitoring role for three contracts. OPUS is undertaking these roles for the two other contracts. Several different contractors are engaged to undertake the physical construction works at the various sites. Maps showing these sites are included in Appendix A.

As well as being main arterial roads the roads are also major utility corridors with numerous water and sewer services, power and telecommunications (above and below ground).

FRA chose to adopt a collaborative approach when working with the utility operators. Utility operators were invited early in the design process to not only renew existing infrastructure directly affected by the road upgrades, but to also install new infrastructure to replace aging infrastructure and to cater for growing demand.

Desired Project Outcomes

The main desired outcomes that FRA wanted from NASRUP are:

- Improve travel times for the local communities and commuters aiming to decrease congestion on these roads

- Enhance the first experience for visitors to Fiji
- Enhance economic development by improving access from the international airports to the adjacent cities and nearby areas
- Provide opportunities for commercial development along the improved road corridors
- An improved driver and pedestrian experience with improved road, lighting, footpaths and road drainage.

The aims of the collaborative approach to utility renewals was to support the above outcomes and also:

- Renew aging infrastructure that could potentially fail and damage the new roads either during construction or in the future
- Move utilities outside of the live road carriageway to improve safety during maintenance/operation and to minimise disruption to the road network
- Allow the FRA to implement a “no-dig for 10 years” policy in the upgraded road corridor
- Provide a method for utility operators to renew large portions of their infrastructure at a reduced cost
- Burying of aboveground infrastructure e.g. power and telecommunications where practicable.

Utility Operators in Fiji

Utility operators in Fiji are predominantly statutory bodies set up by the Fijian Government, generally referred to as service authorities. There are three main service authorities: the Fiji Roads Authority (FRA) manages roads and associated infrastructure, the Water Authority of Fiji (WAF) manages water and sewerage services and the Fiji Electricity Authority (FEA) manages the generation, transmission and retail of electricity.

Telecom Fiji Limited is a limited liability company formed initially from a government commercial company.

Local councils are predominantly responsible for the management of stormwater and drainage networks.

Collaborative Approach Methodology

At the start of the project it was realised that the project could focus wider than just renewal of roading infrastructure. Numerous utilities were identified that were reaching the end of their design lives and in some cases were already failing on a regular basis.

Utility operators were contacted and consulted during meetings and site walkovers to first identify their services. They were then asked to consider which existing assets required replacement or upgrade to meet future expected demand.

During the design of the road upgrades the requirements from the different utility operators were considered and integrated into the roading design. Corridors for different utilities were defined at each site where possible e.g. footpath, berm area etc.

Utility operators were issued copies of the roading designs and proposed utility alignments for comment and eventual approval prior to construction. They were also asked to provide standard details where necessary to enable the construction of their utilities.

The approach in construction has varied. For water and sewer services the main contractor has constructed the majority of the new infrastructure with WAF undertaking connections.

For electricity and telecommunications the main contractor has excavated the trench and the utility operator is responsible for installing the ducts and cables.

Challenges

Numerous challenges were encountered when adopting this collaborative approach.

Firstly, the scale of NASRUP (in size and cost) in Fiji was unusual and challenged the resources of the utility companies both in terms of staff, and technical skills and also funding.

As-built information available for services was basic or non-existent and the condition of existing services largely unknown. Scoping of work was originally completed by collecting existing as-built information, survey of services and site walkovers with service authorities. Potholing was undertaken only once the contract had been awarded to the contractor. This meant that the services design continued well into the construction period.

During construction it was not uncommon for previously unknown services to be found and for services that had been previously assumed to be in good condition to fail once large construction machinery began work on site. This led to a significant increase in the scope of works and also a significant amount of design works taking place during construction.

What was perhaps one of the greatest challenges for utility operators was that this opportunity focussed them on consideration of future plans for infrastructure and growth forecasts. This in many cases meant the pre-emptive installation of multiple cable ducts or the installation of services road crossings for future water and sewer mains.

Coordination of utility providers also proved difficult with many competing requirements. It was critical to ensure the sequencing of the works was well planned between the contractors and utility providers to minimise disruption and rework.

The cost sharing arrangements of the utility renewals were also not clearly defined at the start of the project, which has led to uncertainty around funding particularly with variations.

Good communication between all parties has been crucial in overcoming these challenges and realising the benefits of a collaborative approach which are discussed in the following section.

Benefits

Despite the many challenges discussed above, there were many benefits to the collaborative approach adopted by the FRA including:

- Renewal and upgrade of infrastructure at a reduced cost
- Certainty of utility assets in road reserve
- Minimisation of future utility work in the upgraded areas
- Co-ordination of utility corridors and the removal of most utilities from the live carriageway
- Improved working relationships between FRA and utility operators.

The FRA has also initiated the development of “Memorandum of Understandings” between the FRA and the utility operators. These help to more clearly define utility operators expected contributions (including funding) for future projects.

Key Lessons learnt

Many lessons were learnt during the project including:

- Clear scope definition and specification to be confirmed as early as possible
- Begin the collaboration process as early as possible
- Obtain formal agreement from all parties and commitment to the project, including agreement on funding the works well in advance
- Confirm all services with potholing or service location where available prior to construction
- Confirm services and proposed upgrades before construction
- Ensure adequate programming for service relocations is allowed for

- Ensure any land is acquired prior to award of contract.

Applications in Future Projects in Fiji

The FRA has adopted this approach for several of its larger capital renewal projects including two major bridge replacements in Suva. Learning from NASRUP, utility operators have been contacted much earlier in the project planning process, being involved right from the initial project scoping and investigation stages. This has enabled confirmation of existing utilities and has allowed sufficient time for utility operators to fully consider any upgrades or allowance for future works they may have.

The FRA also make publicly available an indicative forward works programme which is published on their website. This ensures information is freely accessible to utility providers.

The FRA has also begun trialling a similar code to the New Zealand National Code of Practice for Utility Operators Access to Transport Corridors. This allows utility authorities to provide early notification to the FRA of their planned work.

Application in the New Zealand Context

New Zealand is making some progress towards working collaboratively and coordinating asset renewals. We have formal documentation and processes already in place that have the potential to be utilised to achieve collaborative renewals.

The National Code of Practice for Utility Operators’ Access to Transport Corridors introduced in November 2011 has helped in streamlining procedures. Previously notification requirements varied and often consisted of emails sent directly to an individual. The Code requires utility operators and corridor managers to coordinate works within transport corridors

The “beforeudig” online system has also replaced an inefficient method of utility operator and corridor manager notification. This system notifies when details of a project are entered into the online database. Unfortunately notifications

through the system are often only started once a project has been formally scoped and funding allocated. This often means that utility operators and corridor managers do not have time to fully consider whether the project is suitable for a collaborative approach and consequently initiate the collaborative project.

What is also often lacking is the connection between utility operators and a willingness to collaborate. One example is that the practice of trench sharing is often an available option that is not utilised. Individual utility companies often aiming to keep their service as far away from others as possible. The preferred placement for services by local authorities also differs throughout New Zealand.

Funding is also often locked into certain programmes and timeframes with limited flexibility. There is also a requirement on corridor managers to allow service authorities to undertake work in the roads, with limited ability for corridor managers to require works to be done during specific windows.

While local Councils manage local roads, water, sewer and stormwater services, internal departments at larger Councils are often disconnected. There is also a greater trend to setting up separate Council Controlled Organisations to manage wet infrastructure. These organisations have the opportunity to initiate collaborative renewals for larger projects. Shared services approaches are sometimes seen for water, stormwater and sewer services.

The current disconnect between utility operators is a barrier to collaborative working. Power, telecommunications and gas are often several different companies varying by region further complicating the coordination process.

The setting up of SCIRT following the Christchurch earthquake is a good example of how a team can work together to renew infrastructure assets. This was an extraordinary response to circumstances hopefully not to be seen again for some time.

Local Councils are well placed to lead and encourage collaborative asset renewals. They are usually the corridor manager and own the water, wastewater and stormwater utilities. Utility operators should be encouraged to share proposed programmes of work with one another in advance.

There is huge potential to adopt this approach while undertaking works that cause significant disruption to the roading network particularly in CBD areas, upgrades of the state highway network or when undertaking large scale wet infrastructure renewals.

Conclusion

A collaborative approach to asset renewals is best suited to projects where a significant portion of the road corridor will be disturbed.

While there is an initial upfront cost to working collaboratively, there can be cost savings to utility operators. Replacement of utilities as part of one project can:

- Benefit corridor managers as they have certainty of assets in their corridor
- Reduce the overall construction time long term disruption to the public
- Reduce costs to individual utility operators
- Build better working relationships between utility operators.

This paper recommends that local Councils and NZTA as corridor managers:

- Take the lead in identifying projects that may be suitable for a collaborative approach
- Seek to strengthen their relationships with privately owned utility providers
- Encourage utility operators to share proposed programmes of work with one another further in advance and to consider collaborative working where large scale utility renewals are planned.

By adapting the project planning process and undertaking a collaborative approach to asset renewals where appropriate, utility operators and roading corridor managers together have the opportunity to innovate and flourish.

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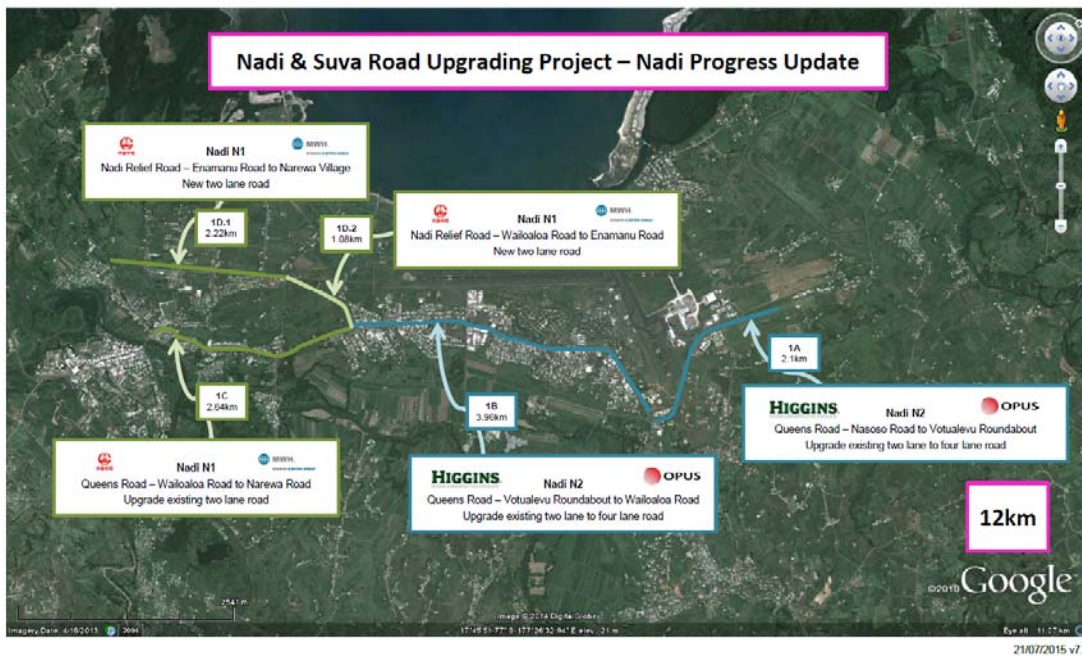
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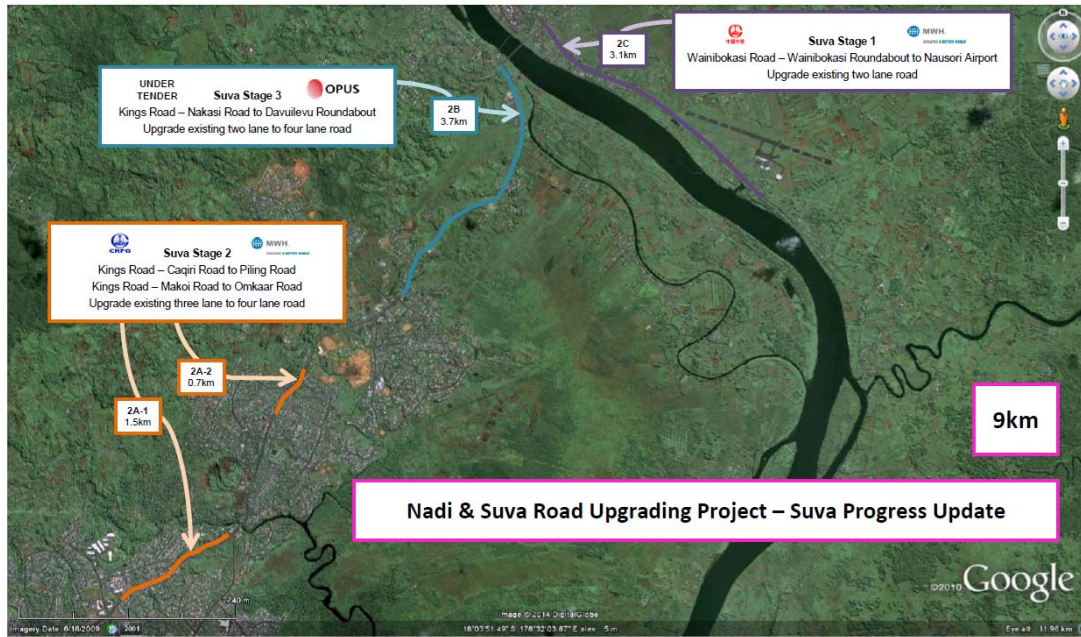
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Appendix A – Project Maps



Map of Nadi Contracts



15/09/2014 v4.0

Map of Suva Contracts

Author Biography and Photograph



Beth Parkin is a Water and Wastewater Engineer with MWH Global. With MWH since 2014, Beth has over seven years' experience in the water supply, stormwater and wastewater sector. Her technical expertise extends to the investigation, design and construction monitoring of a wide range of water reticulation projects. This experience includes site investigation, catchment analysis, pipework design, cost estimation, tender process management and contract management/construction monitoring to NZS 3910. She has been appointed as Engineer's Representative on a number of construction projects.

Her technical expertise is enhanced by solid communication skills. Beth's preferred working style is to share and initiate early discussion. This drives better design solutions and best-for-client and end-user outcomes. Her work as the Water and Wastewater Technical Lead with the Water Authority of Fiji (WAF) on the Nadi and Suva Road Upgrade Project (NASRUP) is an excellent example of this. Beth not only optimised asset renewal decisions, she also helped up-skill the WAF and local MWH staff, via her sharing/collaborative work practice.

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