Adam Smith
INTERNATIONAL

Measuring and Maximising Value for Money in Infrastructure Programmes

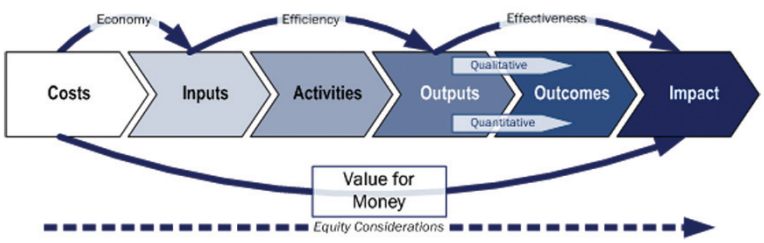

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Table of Contents

Abbreviations

AICD	Africa Infrastructure Country Diagnostic
CBA	Cost benefit analysis
CEA	Cost effectiveness analysis
EE	Enabling environment
EEP S&EA	Energy and Environment Partnership with Southern and East Africa
EIB	European Investment Bank
FTE	Full-time equivalent
GPOBA	Global Partnership on Output-based Aid
HDV	High development value
ICT	Information and Communications Technology
ISP	Infrastructure service providers
MDG	Millennium Development Goals
MDP	Multidimensional programmes
M&E	Monitoring and Evaluation
NIAF	Nigerian Infrastructure Advisory Facility
OVI	Observable Verifiable Indicators
PIDA	Participatory Institute for Development Alternatives
PIDG	Private Infrastructure Development Group
PMU	Project Management Unit
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public private partnership
PSC	Public sector comparator
PSP	Private sector participation
RBF	Results based financing
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SME	Small-medium enterprise
SNTA	Sub-National Technical Assistance Program
TA	Technical Assistance
TAF	Technical Assistance Facility
ToR	Terms of Reference
VfM	Value for Money
VOT	Value of Time
3Es	Economy, Efficiency and Effectiveness

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Executive Summary

The purpose of this guidance note is to equip development practitioners with the tools to measure and maximize VfM in infrastructure programming. It will explain the importance of VfM in infrastructure, how VfM varies across the range of infrastructure programming activities, different models for delivering high VfM infrastructure programmes, and how to integrate VfM through the project cycle.

The lessons and resources in this guidance include:

1. **The particular importance of VfM in infrastructure**: Infrastructure has certain characteristics which magnify the importance of getting VfM right in infrastructure programming, including long time frames, path dependency (lock-in to decisions once made) and infrastructure's central role in poverty reduction.
2. Infrastructure programming covers a range of activities: Infrastructure programming ranges from high level enabling environment reform down to specific project financing and operations – and a range of different sectors – from roads to ICT. The range of infrastructure activities means that **there is no one overarching VfM 'silver bullet' to achieve VfM**. Rather, VfM should be analysed based on the characteristics of the type and sector covered by the programme. This note contains a number of tools for maximizing VfM in each of those activities, summarized in Annex 1.
3. While technical assistance is a major cost centre in donor infrastructure programming, it is a minor consideration in the overall costs of an infrastructure project, such as the construction of a dam or highway. **Good programme design is critical.** Often 'savings' on upstream technical assistance can result in missed opportunities for change and represent poor VfM over the life of an infrastructure investment.
4. **Effective upstream investment can have a positive impact on overall VfM:** While the goal of infrastructure programming may be to produce tangible physical infrastructure, upstream technical assistance can improve downstream VfM. Poor decisions or analysis early in infrastructure development can have significant cost ramifications downstream. Conversely, upstream technical assistance, such as enabling environment reform, can have a multiplier effect on downstream outcomes and impacts; VfM analysis should weigh as many of the multiple downstream outcomes/impacts as possible.
5. Further, it is also important to consider the potential for improving the **centrality of infrastructure operations and maintenance** to secure long-term value and benefit from infrastructure capital investment. This includes considering revenue streams which create viable operation and maintenance enterprises.
6. **The use of benchmarking for unit costs in infrastructure programmes is an important VFM tool but close monitoring of input, output and outcome costs**, across sectors and geographical areas, is necessary. Annex 2 contains details on the factors influencing unit costs and guidance on developing sector specific indicators.
7. **VfM should be assessed throughout the project cycle**, from the business case through the evolution of a programme. This note guides the reader on ways to integrate VfM throughout the project cycle. Appendix 3 contains examples to assist the reader in integrating VfM in a project logframe.
8. **Private provision of infrastructure can provide excellent VfM for infrastructure development.** Annex 4 provides an introduction to private provision of infrastructure through public-private partnerships (PPPs).
9. **Many donors believe it is more efficient and therefore better VfM to support TA and project finance activities through dedicated infrastructure facilities**, which in this context are umbrella donor programmes delivering/coordinating smaller projects**.** Annex 5 contains further information on designing and implementing infrastructure facilities.
10. There are a number of **sources and examples for further information on VfM** in infrastructure. Some are references appear in the text, but for more information, see Annex 6, on sources.

Introduction

1. The Importance of VfM in Infrastructure

Donors spend significant resources on the infrastructure sectors.[1] Many international finance institutions (e.g. Asian Development Bank, World Bank, etc.) spend as much as half of their total resources on infrastructure development. DFID spent nearly £1 billion on infrastructure in 2009-2010.[2]

The main rationale for directing such high volumes of donor funding to infrastructure projects is that well-functioning infrastructure provides the foundation for the development of all other sectors and overall economic growth. Children cannot get to school without functioning transportation systems, the biggest driver of good health is access to clean water, and reliable power is fundamental for a growing industrial sector. **Economies are both literally and figuratively built on infrastructure.**

There are certain characteristics unique to infrastructure, which magnify the importance of measuring and maximising VfM, such as:

- **An essential role in poverty reduction:** Businesses and individuals cannot choose to live without power, water, roads, and, increasingly, telecommunications, if they hope to escape poverty.
- **High sunk costs**: Development or rehabilitation of physical infrastructure has high costs which cannot be recovered. For example, once built a road can't be moved to another location where it would provide higher VfM.
- **Long-term time scales**: Assets and networks are built and maintained over a long timeframe, often extending decades into the future. This makes planning and projections challenging.
- **Visible legacies:** Infrastructure projects are often physically large, highly visible, and accessed by many users many times – like dams, highways, or power stations. Infrastructure can therefore have a long standing impact on public confidence in government.
- **Natural monopolies**: End users rarely have a market choice in infrastructure: there is often only one highway between cities or one sewage system. Therefore, it is critical to develop infrastructure effectively in the first place.
- **Delivery of public goods**: Most infrastructure services serve as public goods, which makes the measurement of outputs, outcomes and impacts even more important as users cannot change suppliers if unhappy with services.
- **Donors fund a wide range of activities**: Infrastructure programmes cover a wide range of activities, from creating an overall enabling environment to financing specific projects. Each of these standalone activities has distinctive types of outputs and outcomes, but impacts are interrelated as early phase activities will impact the success of downstream activities.
- **High impact on marginalised groups**: In many developing countries the impact of deficient infrastructure is greatest on marginalised groups including the poorest communities, women and girls, the elderly and the disabled.[3]
- **Mixed public and private service provision**: Increasingly, infrastructure is developed and maintained by private entities or through public-private partnerships (PPPs). While private sector participation (PSP) represents a major opportunity to better allocate risks and costs, mixed service provision is complicated and demands a significant technical expertise in the public procurement, regulatory and oversight agencies.

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1 For the scope of what is meant by infrastructure, this note will utilize the OECD definition of "Economic Infrastructure" which includes: transport, energy, information and communication technology, drinking water and sanitation, and irrigation.

2 DFID's Role in Building Infrastructure in Developing Countries, September 2011.

3 DFID's Role in Building Infrastructure in Developing Countries, September 2011.

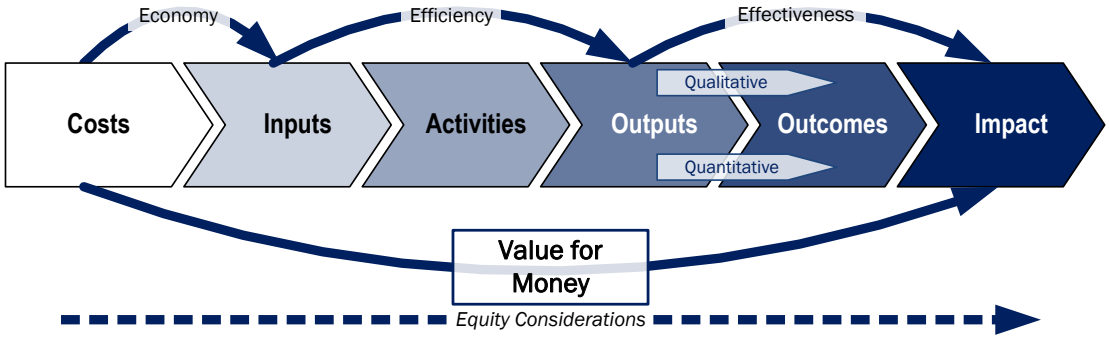
Considering the sums of money involved, the critical role infrastructure plays in poverty reduction, and the unique characteristics of infrastructure, it is essential that donors maximise and measure VfM in infrastructure programming.

2. DFID/Donor Considerations for VfM in Infrastructure

2.1. The Results Chain & Logframe Approach

Donors generally use a "results-based management" approach to monitor and evaluate the performance of their activities ("activities" meaning all forms of donor support such as technical assistance, capacity building, project financing, etc.). Donors focus on whether or not their support created positive, lasting changes. The funding and deliverables of the activities are only the means: the ends are what matters most.

DFID, for example, has a standard Results Chain framework (see below). Although some of the terminology varies from country to country, all major bilateral donors and multi-lateral development agencies also monitor the costs of their inputs, whether or not these inputs led to outputs (i.e. deliverables), and whether or not the outputs created desired outcomes and long-term impacts.



The phases of a donor's activities are defined as:

Inputs: Inputs cover all the materially significant financial, human and material resources used for a development intervention (e.g. including expert advice on the enabling environment for infrastructure and preparation and financing of infrastructure facilities).

Processes: The activities used to deliver outputs (e.g. advisors meeting with recipient clients to transfer sector knowledge). It is important to define these processes in order to set intermediate milestones for measuring progress in implementing projects.

Outputs: The products, capital assets and services which result from a development intervention (e.g. reports, training sessions, etc.). Outputs are limited to the specific, direct deliverable of the intervention.

Outcomes: The likely or realised short-term/medium-term effects of the outputs of any intervention (e.g. better policies followed, new approaches used, etc.). Outcomes are used to identify (a) what will change, (b) who will benefit and (c) how it will contribute to poverty reduction and/or the MDGs. It may be useful to specify intermediate outcomes, which lie between outputs and full, desired outcomes.

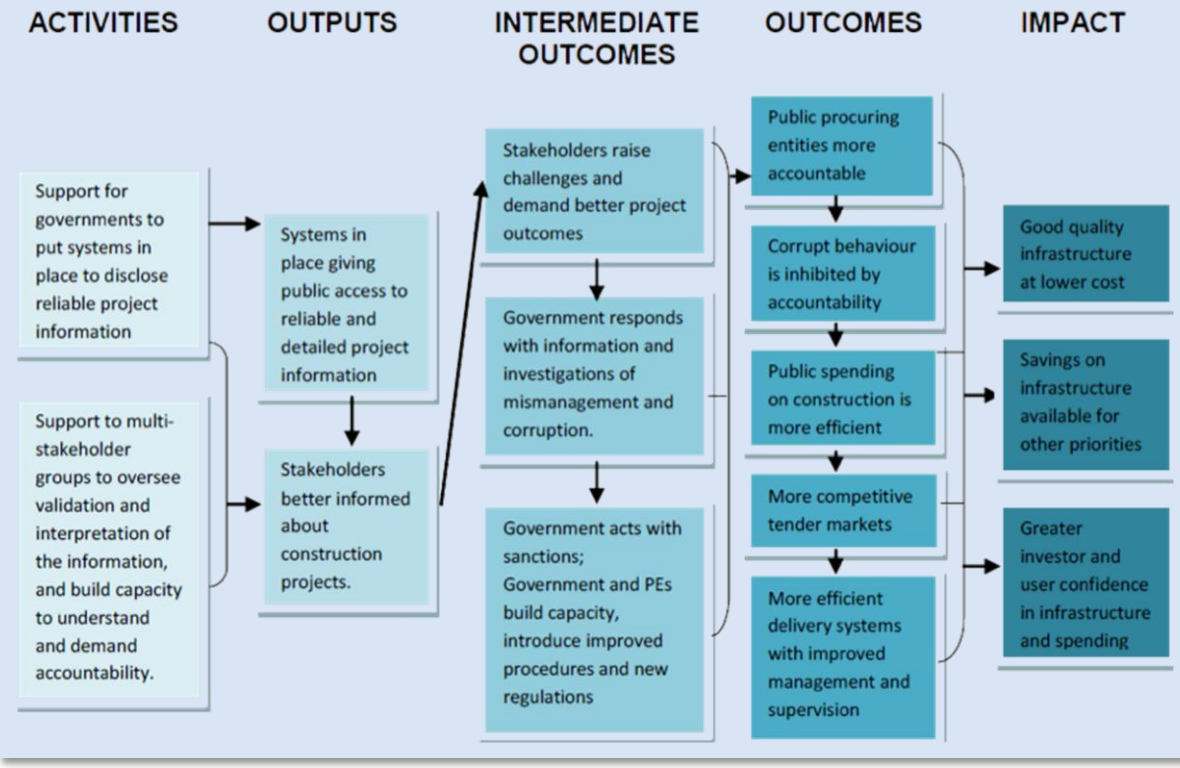
Impacts: Longer-term effects produced, directly or indirectly, by a development intervention. Impact refers to higher level identified achievements that the intervention will contribute towards (e.g. cleaner water leads to lower infant mortality rates).

To measure the performance of an activity vis-a-vis the Results Chain, DFID, like other donors, uses a standard tracking framework, called DFID's Logical Framework Approach ("Logframe"). The Logframe is activity specific and details the precise indicators that will be used to measure whether or not an activity is achieving its intended outputs, outcomes, and impacts. These OVIs have milestones of what is hoped to be achieved at different intervals of the project's life, as well as final targets for the entire project. The below box on the Construction Sector Transparency Initiative (CoST) provides an example of how the Results Chain and Logframe are applied in practice.

Example: Results Chain and Logframe

The Construction Sector Transparency Initiative (CoST) is an international multi-stakeholder initiative to increase transparency and accountability in the construction sector. CoST seeks to enhance transparency in public construction by ensuring that basic information on projects is disclosed to the public at key points throughout the project cycle. Construction sector transparency is critical for reducing costs of infrastructure development, especially in the roads sector.

The diagram below delineates the key components of the causal chain for the CoST Logframe.



2.2. The 3E Framework: Economy, Efficiency and Effectiveness

The concepts of economy, efficiency and effectiveness (collectively the "3 E's") are keys to measuring VfM throughout the Results Chain. In general, VfM can be assessed across the 3 E's in the following manner:

Economy relates to how cost-effectively financial, human or material resources are acquired and used in an intervention. VfM is typically assessed in terms of the unit costs of inputs involved (e.g. how much a TA costs). At the economy level, VfM focuses on cost control, and it is important to scrutinise the unit costs of key VfM drivers, such as personnel costs, procurement costs, travel costs, and other costs, and then compare these costs to the quality received and examination of key cost/value ratios.

Efficiency relates to how resourcefully inputs are converted into outputs and subsequent outcomes. Cost efficiency measures can throw light on options for a donor intervention (e.g. will outcomes be achieved more efficiently by a donor managing an activity directly or setting-up a PMU). VfM is typically assessed on how quickly, accurately, and sustainably outputs can lead to desired outcomes. Quality and approach are keys to maximising VfM.

Effectiveness relates to how successfully an intervention achieves its intended outcomes and subsequent impacts are realised (e.g. in attracting additional private financing to fund infrastructure investment, increasing the capacity of infrastructure operations, expanding access of target populations). VfM is typically assessed by whether or not the milestones and targets of observable verifiable indicators (OVIS) are achieved. Results matter.

To reach an assessment of the overall value for money (which we will call **Overall VfM**) of an intervention or programme requires weighing the analyses of its economy, efficiency and effectiveness, and reaches a synthetic conclusion.

This Guidance Note, therefore, concentrates on the relationship between VfM and the 3 E's for different types of infrastructure programmes and for different stages of the Project Cycle. As VfM is a result-oriented methodology, highest priority is generally given to the effectiveness criterion.

3. Summary of the Tools Available in this Guidance Note

This Guidance Note focuses on different approaches to measuring VfM in infrastructure activities. It is intended to provide practical tools for DFID staff and their counterparts at other development agencies engaged in infrastructure development, design, and monitoring and evaluation.

The Guidance note looks at VfM approaches for both stand-alone activities, which are directly financed by a donor organisation, and for infrastructure facilities, which are trust funds, programs, and other forms of bi-lateral or multi-lateral assistance.

The Guidance Note divides infrastructure activities into five main categories. They are:

- Enabling Environment Reform – The development of sector strategies and policies, strategic options analysis, laws and regulations, and other forms of early-stage planning and policy support.
- Institution, Capacity and Consensus Building – Working directly within government and regulatory agencies and infrastructure service providers to provide organisation planning, capacity building, consensus building, and other forms of direct assistance and training.
- Project Preparation and Development – The development of feasibility studies, project appraisals, project development documents, transaction support guidance, risk mitigation instrument design, and other forms of early-stage, direct project support.

- Project Financing – Directly funding projects through direct construction, project financing, equity and debt funds, guarantees and credit enhancements, and other forms of project support.
- Operator Performance Improvement – Improving operators' performance through such things as restructuring infrastructure operators, unbundling power sector delivery, and other forms of operations and maintenance support.

In addition to applying VfM across the 5 activity types stated above, this Guidance Note also considers the special characteristics of infrastructure facilities. In recent years DFID has developed innovative approaches to the design, development and delivery of technical assistance programmes through the infrastructure advisory facility approach. The use of infrastructure facilities is considered in their ability to increase VfM and leverage economies-of-scale. As these facilities require a higher level of VfM oversight, specific VfM criteria are detailed for these types of models.

This document also provides guidance on how to apply VfM through the entire project life cycle. The VfM dimension should be incorporated as early as the Business Case stage, and this document outlines approaches for accomplishing that. In addition, throughout this Guidance Note there are examples of good VfM-focused indicators (i.e. Logframe indicators that best capture VfM attributes). Finally, it is critical for DFID and other donors to base the tough decisions – how to determine if an activity or programme was successful, whether or not to continue an activity or programme, etc. – on quantified VfM analysis. This document therefore also provides guidance on the Implementation and Evaluation stages of the project life cycle.

The Guidance Note also contains 6 Annexes:

- Annex 1. Summary Tables
- Annex 2. Sector Specific Indicators
- Annex 3. Example Logframe Metrics
- Annex 4. Assessing VfM of Public-Private Partnerships
- Annex 5. Infrastructure Facility Models
- Annex 6. Sources

Guidance Note

1. Applying VfM Across the Range of Infrastructure Activities

In the 1970s and 1980s much of the donor infrastructure funding focused simply on building infrastructure assets (e.g. new roads, power plants, etc.) without sector-wide, long-term strategies, without enough regard for whether or not recipient countries had the expertise and resources to manage the infrastructure once built, and without putting in place the systems and capacity for recipients to further develop the sectors on their own. As a result, some infrastructure built at that time was not maintained properly and is being rebuilt today.

As a result of these experiences, donor infrastructure funding is generally directed to upstream technical assistance (TA), such as developing strategies, drafting regulations, building government capacity, and conducting project feasibility analysis. These are important for sund infrastructure development because poor advice, planning and design at early stages of the cycle can lead to much more costly adjustments at later stages. Examples of poor advice, planning and design include:

- Poor upstream analysis, due to lack of capacity of advisers or lack of investment in technical analysis;
- Bad data or poor assumptions underpinning upstream analysis;
- Corruption / favouritism in the project allocation phase;
- Poor allocation of risks which limit the availability of project financing;
- Procurement agents who award contracts to parties who under deliver;
- Insufficient construction incentives which lead to cost/time overruns; and
- Poor operations/maintenance planning which reduces the life of the assets.

TA typically only accounts for a fraction (e.g. 1%-2%) of total project cost based on many IFC projects.[4] 'Savings' which result in underfunding of upstream TA, therefore, can have an exponentially negative impact on VfM measurements downstream. If VfM is to be maximized, making high-quality choices in programme design, setting the right targets, and selecting and monitoring service providers effectively is essential.

Poor decisions or analysis early in infrastructure development can have significant cost ramifications downstream.

Donor infrastructure funding spans a wide range of activities, from reforming the enabling environment to improving the operation of existing infrastructure. Each of these activities has distinctive types of outputs, outcomes, and desired impacts, and thus it is important to consider how VfM analysis should be targeted to each individual type of activity.

A large portion of donor funding for infrastructure is channelled through multi-dimensional infrastructure programmes. These include bilateral infrastructure facilities, such the Nigerian Infrastructure Advisory Facility (NIAF), multi-donor programs, such as the Private Infrastructure Development Group (PIDG), and multi-donor trust funds, such as the Public-Private Infrastructure Advisory Facility (PPIAF). Conducting VfM analysis on a programmatic level often requires assessing a spectrum of activities and measuring broader development objectives.

The table below provides an overview of the five general activity categories of infrastructure activities.

[4] IFC Transaction Advisory Services.

Table 1. Infrastructure Development Activities		
Activity Category	**Common Scope**	**Examples**
Enabling Environment Reform	» Sector Strategies » Strategic Options Analysis » Laws and Regulations	» Togo Telecoms Strategy (PPIAF) » Djibouti Energy Sector Master Plan (ESMAP)
Institution, Capacity and Consensus Building	» Organization Planning » Capacity Building » Consensus Building	» Nigeria Federal PPP Unit (NIAF) » Water Financing Guidance (WSP) » Toolkits (PPIAF)
Project Preparation and Development	» Feasibility Studies/ Project Appraisals » Project Development » Transaction Support » Risk Mitigation Instruments	» PIDA » Infraco Africa » Senegal Toll Road (PPIAF) » Transaction Advising (IFC)
Project Financing	» Direct Construction » Project Financing » Equity and Debt Funds » Guarantees and Credit Enhancement	» DFID Country Programs » EAIF » Guarantco » Peru Lima Municipality (SNTA) » GPOBA Access Projects
Operator Performance Improvement	» Restructuring Transportation Operators » Unbundling Power Sector Delivery » Direct Assistance to Distribution Companies	» Power Sector Reform (NIAF) » HDM-4 Implementation Management Contracts (USAID)

1.1. Enabling Environment Reform

The term “enabling environment” refers to the rules, systems, and strategies that governments can use to develop infrastructure. In many developing countries the enabling environment is either weak, meaning that clear strategies and regulations are not in place to guide government and project developers, or are cumbersome and counter-productive and hinder infrastructure development. The aim of development assistance in this area is to improve policy and regulatory certainty for infrastructure operators and investors.

As enabling environment reform is knowledge-based assistance, service provider fees and costs are typically the main cost driver of upstream assistance; however, as discussed above, the performance of contractors and “buy-in” from the clients can have a major impact on the long term VfM. Therefore, **the first VfM objective must be to contract high quality advisory support at the most reasonable cost possible**. However, enabling environment consulting is particularly susceptible to delivering ‘shelfware’ – unread documents ending up on shelves. So, **the second major VfM objective must be to ensure that high quality outputs with strong local ownership.**

The best way to ensure these results is that advisors build a personal, trusting relationship with the client, and this must be done face-to-face over time. This is why, for example, key criteria in selecting advisory support is the quantity (e.g. man days in country, days on clients premise) and quality (e.g. existing country relationships, seniority of advisory in-country support) that will take place directly with clients.

To extract the greatest VfM in enabling environment reform activities, donors should be willing to spend the necessary resources to ensure that the desired outcomes are achieved (and not just fund outputs).

The Public-Private Infrastructure Advisory Facility (PPIAF), one of the most established multi-donor trust funds which funds enabling environment activities, provides an interesting benchmark for the success rate of desired outcomes. The 2008 PPIAF Strategic Review analysed about half of the 2000-2008 PPIAF portfolio of that time to determine if activities had achieved their desired outcomes. The analysis identified 189 enabling environment interventions that intended to lead to a policy/strategy being adopted or a law/regulation being implemented. The analysis showed that 39% of the interventions achieved desired outcomes.

Table 2. PPIAF Analysis of Outcomes of Completed Activities		
Type of Intervention	**Number Analysed**	**% Implemented/Transacted**
Policy and Strategy Advice	125	39%
Legal and Regulatory Frameworks	64	38%

Source: CEPA, PPIAF Strategic Review 2008, Final Report pp. 83-84

While the above success rates demonstrates that over half of the enabling environment activities did not lead to desired outcomes, a success rate of around 40% can be considered quite effective on average given enabling environment reform is a challenging task. The adoption of a new policy or the implementation of a new regulatory regime requires a variety of factors to come together. Most importantly, there must be sustained **political will and** adept **political timing**. Activities that do not have broad-based political support and/or that are taking place too close to election times will have a much lower probability of leading to a desired outcome.

The downstream impacts of enabling environment activities also can have a **multiplier effect**. A one-time enabling environment activity can lead to a completely new approach to how a country develops its infrastructure. Where this is the case there can be very strong VfM – with a relatively low-cost intervention having a significant development impact. For example, the PPIAF support to the government of Malawi led to the adoption of a strong legislative and institutional PPP framework that paves the way for increased PSP in the provision of basic infrastructure services. The government commitment to the PPP agenda and the sound enabling environment for PPPs facilitated by PPIAF should help to build a pipeline of many PPP transactions in Malawi.

Successful upstream projects, such as enabling environment reform assistance, can have a multiplier effect on downstream outcomes and impacts – as one new strategy or regulatory framework can lead to several new projects – and VfM analysis should weigh all of the multiple downstream outcomes/impacts.

The below table provides examples of various approaches to the measurement VfM in enabling environment activities.

Table 3. Measuring VfM in Enabling Environment Activities		
Economy	**Examples of What to Measure**	**Key Considerations**
	» Consultants' credentials / CVs / past performance record » Type of expertise required (the more specialised the professional discipline, the higher cost) » Level of responsibility attached to the assignment » Duration of engagement (long- or short-term) » Difficultly (both physical and reputational) of the post (whether it is in a fragile state or more stable country) » Regional and local market factors » The proposed ratio of costs spent on developing vs. implementing the law/regulation/policy/strategy (sufficient focus on implementing is important).	» Donor procurement systems already create cost efficiencies » Reducing costs often can lead to reduced quality, which in turn leads to reduce outcomes and impacts
Efficiency	**Examples of What to Measure**	**Key Considerations**
	» Numbers of business policies analysed or implemented per £1m of TA spend » Numbers of laws/regulations analysed or enacted per £1m of TA spend » Population of potential service area per cost per £1m of TA spending	» There is an economics of scale for "going big," but more decision makers will be involved » Usually the goal is to only develop 1 new law/regulation/policy/strategy
Impact	**Examples of What to Measure**	**Key Considerations**
	» Reduction in number of days for PPP project to go through the full project cycle » Value of projects formally entering the new planning or funding system per £1m of TA spend » Time savings (e.g. weeks, days, hours) due to significant improvements in service delivery (e.g. reduction in the number of days for clearance of goods in ports) » Opinion surveys of private project developers	» Can lead to a multiplier effect downstream (e.g. one new law leads to many new projects). » Increased transparency to the system is hard to measure, but also very valuable

1.2. Institution, Capacity, and Consensus Building

Human and institutional capacities are crucial to effectively developing infrastructure. Promoting awareness and understanding is central to strengthening stakeholder ownership of policies, process and projects, and to building consensus for reform.[5] VfM analysis should therefore also focus on how well development activities contribute to establishing effective institutions (mandates, management structures, processes, etc.), strengthening their capacities to operate efficiently (training, embedded advisors, etc.) and building consensus for infrastructure development among all key stakeholders

Typically several government institutions have overlapping responsibilities for infrastructure development. In the power sector, for example, there may be a Ministry of Energy (which has overall planning responsibilities), private and/or state-owned power generation companies, a state-owned transmission company, private and/or state-owned distribution companies, rural electrification companies/coops, an energy regulator, a PPP agency, and a variety of energy market agencies. **It is essential that all of these institutions have clear responsibilities and well-trained staff, and collaborate together towards overall sectoral goals.**

Person-to-person assistance on the technical working level and effective interagency communication are also important to create an efficient environment for infrastructure investment. Additionally, donor assistance to fund the purchase of operational equipment, such as computers or software (e.g. HDM-4 road maintenance software) may be needed to building institutional capacity.

As with enabling environment activities, a major VfM objective with capacity building activities is to contract **high quality advisory support at reasonable costs**. Many of the same aspects of contracting consultants for enabling environment work also apply here – to make sure that outcomes (and not outputs) are the focus of any assistance. The 2008 PPIAF Strategic Review mentioned above looked at "Institution Building" and found that 45% of 33 activities reached their desired outcome. While it's possible to say an institution was created at a specific point in time, VfM analysis with capacity and consensus building should be an on-going process and continually monitored and adjusted if outcomes are to be efficiently achieved.

VfM indicators for capacity building activities should be monitored at shorter intervals and more flexibly to allow for adjustments in resource allocation (e.g. increasing/reducing the number of advisors) to match the progress towards desired outcomes.

Training and consensus building activities are likely to be carried out over extended periods. Bearing in mind that circumstances change over time, **the critical ways to minimize inputs costs are**:

- By careful scoping and procurement of the consultancy services commissioned;
- Stipulating up-front that adjustments can be made to resource allocation and the system and periods for doing so; and
- By continuous monitoring the delivery of the services during implementation to curtail or adapt those based on outcome progress.

For example, embedded advisors should have regular reporting cycles (e.g. monthly) and, depending on how an activity is progressing, advisors may need to be rotated or the number of advisors may need to increase/decrease.

Like with other TA support, the overall VfM assessment of a capacity building activity should reflect its performance against all of the economy, efficiency and effectiveness criteria. However, the relevance of the individual criterion typically vary throughout the assistance period. The below table provides examples of various ways to measure VfM in capacity building activities.

[5] On consensus building see PPIAF, *Emerging Lessons in Consensus Building for Public-Private Infrastructure*, July 2002.

Table 4. Measuring VfM in Capacity Building Activities		
Economy	**Examples of What to Measure**	**Key Considerations**
	» Consultants' credentials, with particular regard to direct "teaching" experience » Costs associated with having fulltime resident assistance vs. periodic consultant visits (e.g. expat living costs vs. airfares) » Duration of engagement (long- or short-term) and the available budget to ramp-up if progress is good » Difficultly (both physical and reputational) of the post (whether it is in a fragile state or more stable country) » Regional and local market factors; comparing international advisors with local advisors	» The ability to make cost adjustments (so all costs are not sunk immediately upon awarding the project) allows for the better matching of expenses to progress towards outcomes.
Efficiency	**Examples of What to Measure**	**Key Consideration**
	» Numbers of man days spent on-site / embedded per £1m of TA spend » Number of people trained per £1m of TA spend » Number of people using new software / system » Volume of infrastructure service using new software / system (e.g. what % of costumers now receive metered water bill) » Quantity of software installed / people trained to use per £1m of TA spend	» The implementation of new systems can show immediate efficiency improvements. For example, moving to a metered, automatic billing system for electricity or water distribution will reduce graft and improve collections.
Effectiveness	**Examples of What to Measure**	**Key Considerations**
	» Efficiency gains in operation from the use of new approaches, software, systems, etc. (e.g. reduction in man days needed to develop annual road maintenance plan). » % decline in surveys of service users reporting corruption/bribe paying	» It is challenging to attribute overall outcomes to advisory work » Systems are only impactful if people use them

1.3. Project Preparation and Development

Measuring VfM with project preparation activities is more straightforward than with other types of activities as the desired outcomes are more tangible and clear from the beginning (e.g. reaching commercial / financial closure and subsequently having the infrastructure built). The impact will depend on the cost and quality of the infrastructure service is for the actual users, in particular the poor.

VfM indicator targets should be heavily weighted towards the desired final outcome, as they are more definitive and are more critically important than achieving intermediate milestones.

In terms of key cost categories for project preparation and development, technical assistance is similar to enabling environment and capacity building. Project preparation outputs often are reports and studies, which serve, for example, to justify an investment decision. They are concerned with demonstrating "**bankability**," confirming the commercial viability of an investment project, via financial, economic, social, technical, institutional, and environmental feasibility assessment which is critically to attracting private investors. As these outputs are common across similar project types and countries, the TA is usually much more standardized and costs benchmarks are more readily available. For example, the scope and format of environmental assessments infrastructure projects have become fairly standardized, and there are many companies that do them.

Another key category of project preparation assistance is **transaction advice**. Governments often hire a transaction advisory company to run a PPP tendering process from start to finish, and even hire and manage other consulting companies. The contracts can be substantial but also have a clear VfM trigger in that much of the payments are performance driven – the tender has to be successful for the consulting company to receive much of their payments (often 50% or more).[6]

Preparing and structuring projects can involve considerable time, resources and commitment. In developing countries, the risks associated with projects extend well beyond the normal project

[6] IFC Transaction Advisory Services.

commercial, technical and environmental risks. A weak legal and regulatory framework and lack of a track record of PPPs, also often play a major role in dissuading investors from funding projects in many developing countries. Project preparation activities therefore usually depend on complementary enabling environment and capacity building activities, to overcome the obstacles to increasing investment in infrastructure.[7]

In comparison to other types of TA activities**, project preparation costs can often be higher and sometimes increase as the project develops** because:

- Project preparation is more complicated than anticipated, particularly if building local stakeholder support has not been given enough attention;
- Upstream enabling environment reform was inadequate;
- Requests for clarification / due diligence from private investors creates additional TA; and
- Tenders have to be run multiply times (and the transaction advisors are re-contracted).

In short, high-quality enabling environment and capacity building activities are crucial to properly setting the stage for successful project preparation activities. In addition, since the process can get out of hand if not managed carefully, many donors have also funded project preparation programmes to provide specialized and continuous support to project preparation activities.

Experience shows that costs for project preparation activities can increase quickly if not monitored well, and require direct, in-country oversight.

In an effort to respond to these challenge, a range of vehicles have been set up to promote the bankability of investments project through supporting project preparation and development. Examples include:

Table 5. Examples of Project Preparation and Development Related Programs

Programme	Main activities related to Project Preparation and Development
PPIAF	Funds assistance to prepare and transact pioneering infrastructure projects. Advisory support for project in post financial close stage
Technical Assistance Facility (TAF, PIDG Group)	Supports PIDG facilities on evaluation of financing options, design and implementation of pioneering transactions and providing post-transaction support
Energy and Environment Partnership with Southern and East Africa	Funds feasibility studies and demonstration pilot schemes to support off-grid low carbon energy projects.
SADC Trans-border Border PP Fund (CRIDF)	Finances pre-feasibility and feasibility studies for infrastructure projects in the water sector (among other activities)
InfraCo Africa InfraCo Asia (PIDG Group)	Identifies and develops greenfield investment opportunities to the stage where they can attract domestic and international finance and reach financial close. InfraCo takes an equity stake of the project than later sells once the project is fully prepared and structured.

[7] PPIAF, Guide for Hiring and Managing Advisors for Private Participation in Infrastructure, Vol. 3, How to Manage and Select PPI Advisors.

Project Preparation and Development Examples

The Energy and Environment Partnership with Southern and East Africa (EEP-S&EA) finances the pre-feasibility and feasibility studies for small scale renewable energy investments. EEP-S&EA's total administration costs are under 25% of the total fund and it is housed within a government department. While these administration costs may seem high and not great VfM, they also cover the EEP-S&EA staff time that is heavily involved in the oversight of the project preparation activities that it funds.

Another example of bundling project preparation activities to achieve good VfM is the Private Enterprise Partnership – Southeast Europe Infrastructure (PEPSEI). This multi-donor trust fund is managed by the IFC to fund transaction advisory support for PPPs in the Balkans. VfM indicators that PEPSEI tracks include: percentage of projects closed versus terminated, number of days to complete transaction, USD of investment leveraged per USD of TA spent, tons of GHGs reduced by project (which have a market value), and number of people receiving new service.

The success rate of project preparation activities vary widely. For example, the evaluation of the NEPAD Infrastructure project preparation fund states that only 4 out of 32 projects supported were actually implemented. Other experiences such as EEP-S&EA indicate a 45% success rate of project preparation documents. The 2008 Strategic Review of PPIAF analysed the outcomes of 16 preparation activities between 2001 and 2008, and found that 56% of these led to implementation.

The below table provides examples of various ways to measure VfM in project preparation activities.

Table 6: Measuring VfM in Project Preparation Activities

Economy	Examples of What to Measure	Key Considerations
	» Consultants' credentials, with particular regard to transaction success experience » Costs associated with having fulltime resident assistance vs. periodic consultant visits (normally international advisors are required) » Difficultly (both physical and reputational) of the post (whether it is in a fragile state or more stable country) » & of contract that is performance based payments	» It is important to have an up-front, clear, comprehensive framework of all of the PDD "pieces of the puzzle" that are required and how they will fit together. » Often PDD activities take a long time to perform (>1 year) so budgeting is more challenging
Efficiency	**Examples of What to Measure**	**Key Considerations**
	» Cost and timeliness of technical feasibility work (e.g. environmental assessment) compared to international benchmarks » Total PDD study cost as a % of the expected total infrastructure project investment » Number of days to from Expression of Interests to Short-listing to Project Tendering to Commercial Closure to Financial Closure	» While efficiency is important, particularly as these activities are often covered by the media, it can be mitigated on a VfM level by having payments targeted towards performance and outcomes.
Effectiveness	**Examples of What to Measure**	**Key Considerations**
	» The number of bidders in a PPP tender » Whether or not the tender was successful » Whether or not the infrastructure was built » Positive opinions from private companies participating in the PPP bid	» In many ways "all or nothing" – was the PPP tender successful

1.4. Project Financing

Maximizing VfM with project financing activities involves two major objectives: keeping construction costs on or under budget and making sure the works produce the desired quality of service at an economic cost. Unfortunately, **there is a long history of construction projects going over budget**, especially if they are donor or government funded. In addition, there is an equally unfortunate history of the actual works being sub-standard (e.g. contractors skimping on road thickness). The root cause of these problems is that the construction contractor and the donor too often have opposing incentives – the contractor wants to maximize their construction income and are less concerned with the long-

term impact of the infrastructure (unless they are also the operator) whereas the donor wants to have the infrastructure built to maximum standards and operating efficiently.

Project financing activities are intended to **address the scarcity of long-term financing for infrastructure projects**. Because commercial lenders generally perceive infrastructure investments (especially with water distribution) as high risk and constrained by public service considerations, they are often reluctant to provide long-term loans to infrastructure projects. In response to this market failure, donors can act as catalysts by providing equity, debt, and guarantees to attract additional funding for infrastructure in low income countries.

Donors finance infrastructure, both directly and indirectly. Direct financing involves donor funding to construct new infrastructure assets (i.e. greenfield projects) or upgrade of existing facilities. In addition, donors support infrastructure investments indirectly through contributing to investment funds, which co-finance capital projects with private sector investors, or providing guarantees and other forms of credit enhancement. For example, DFID (through the PIDG Trust) funds the Emerging Africa Infrastructure Fund, which provides long-term foreign currency loans for private sector infrastructure projects in Sub-Saharan Africa.

Although mechanisms for delivering project financing support all aim to contribute to the desired outcomes of increasing access and improving service quality, the approach to assessing VfM should reflect whether the financing is direct or indirect. For direct projects, VfM analysis is mainly focused on specific investment projects in real-time as they develop. For indirect financing through intermediaries, VfM analysis needs to also assess the efficiency of the fund structure and the effectiveness of its overall investment portfolio.

As donors usually provide finance to a larger pool of total funding, when analysing VfM of the investment institution or program it is important to **ensure that total economic resource costs are included**. In other words, all costs that contribute to the outcome of the activity should be measured and included in VfM analysis – whether they are incurred by donors, private sector investors, or by end users (e.g. transport costs to reach a water pipe). As funding is disbursed at different times in the project cycle, sometimes years apart, it is also important that costs are discounted using a country specific discount rate. In addition, the analysis should cover the costs of providing adequate maintenance of the infrastructure works after project completion.

Unlike TA activities, project financing usually involves the financing of fixed assets (construction works and capital equipment) and physical inputs, and these items form the basis for most VfM indicators. The construction costs often vary widely between countries, in some cases reflecting the commercial practices of local contractors. In some less developed countries, third party contractor may seek to reap the benefits of the sunk costs of items procured for project (e.g. by keeping a truck after the project is completed). A major VfM driver of directly financed projects will be to ensure that construction companies do not expropriate assets paid for by the project. Another major VfM driver will be to make sure contractor's source inputs cost-effectively (e.g. based on competitive quotations).

Major VfM drivers with direct project financing activities are to ensure that construction companies use cost effective procurement to source inputs locally and do not benefit from sunk costs.

A commonly used technique today to maximize VfM is "**Results-based Financing**" (RBF). Traditionally, construction contractual agreements are usually input-based contracts, whereby payment is made upon the delivery of inputs regardless of the outputs and outcomes that result. Alternatively, under RBF contracts payment is made when the desired outcomes are achieved. The idea is to shift the risk burden from the donor to the construction company. The Global Partnership on Output-based Aid (GPOBA) is a DFID-initiated, multi-donor trust fund that focuses exclusively on RBF.[8]

[8] World Bank, Output Based Aid: Lessons Learned and Best Practice, March 2010.

With PPPs, VfM can be assured by shifting responsibility for construction to the private developer, but this requires detailed drafting and negotiation of the contractual arrangements.[9] In Chile, for example, the PPP concession term begins at contract awarding as opposed to beginning at the end of construction works. This creates an incentive to complete construction on schedule. Developers are also encouraged to keep construction costs below budget, as the tariff rates they can charge are fixed at the time of contract awarding and any construction costs overruns directly go to the developer's bottom line.

Results-based Financing (RBF) and PPPs can be effective ways to shift the risk of increased construction costs to construction companies, but take time to develop and impalement

Project financing activities should focus on achieving appropriate performance requirements, and not aim for the highest possible technical standards. Infrastructure that is over-designed is not only more expensive than necessary to build but also more expensive to maintain, and thus inefficient in terms of VfM. For example, in many parts of Africa traffic volumes for roads are comparably low due to low car ownership, and characterised by a high proportion of non-motorised traffic, such as passenger bicycles. However, there has been a tendency to require higher standards of construction than are necessary for such low traffic volume environments.[10]

While TA activities should focus on achieving the highest quality outputs, project financing activities should be aim to achieve the minimum quality required to meet necessary infrastructure performance.

Another factor that should be considered in analysing VfM of directly financed projects is to estimate the **attribution of benefits** relative to the composition of costs. The breakdown of the total project cost between capital expenditures (CAPEX) and operational expenditures (OPEX) are the keys to effective cost attribution. For example, if the CAPEX proportion of total costs is 74% then only 74% of total benefits calculated can be attributed to the project financing activity.

The below table provides examples of various ways to measure VfM in project financing activities.

Table 7. Measuring VfM in Project Financing Activities

Economy	Examples of What to Measure	Key Considerations
	» Independent assessment of delivery agent's procurement and contract management capacity » Evidence of minimal sunk costs of existing equipment/cost sharing » Evidence of quality indicators of operations and works » Quality factors, such as proposed approach to construction supervision, environmental and social impacts, on-going maintenance, etc. » Cost of equipment, systems and processes » Evidence of scale economies » Local procurement and transport costs where possible	» These activities are all about minimizing costs, but while still achieving performance standards.
Efficiency	**Examples of What to Measure**	**Key Considerations**
	» % of payments that are linked to outputs (and even better yet outcomes) » Time frame for completing works » Quantity of workers and equipment employed for project	» It is important to remain on schedule and on budget, but both must be realistic when the contract is awarded.
Effectiveness	**Examples of What to Measure**	**Key Considerations**
	» Number of kilometres of road built/upgraded per £1m investment » Amount of construction risk being taken on by contractor	» As long as performance standards are met

[9] See Annex 4 for discussion of the lessons learned from PPP transactions.
[10] Ref: Coffey: DFID business case; Economic appraisal RITE2 phase 2 report Dec 2011.

1.5. Operational Performance Improvement

Donors also support technical assistance **to improve infrastructure operators' performance –** for example, by reducing production and distribution losses, improving revenue collection, ensuring effective maintenance of infrastructure assets or applying new technologies which have the potential to offer substantial efficiency gains.[11]

This is an area where VfM analysis is directly relevant and relatively easier to apply since most of the outcomes of these activities as well as the inputs can be quantified in monetary terms. In addition, in Africa is particular many public utilities are poorly managed and **there are plenty of opportunities for achieving significant improvements in efficiency**. For example, it is estimated that about 30% of the infrastructure assets of a typical African country are in need of rehabilitation (more in the case of rural roads). Distribution losses of water utilities are often twice as high as technical best practice. Implementing sound preventive maintenance regimes often costs only a fraction of rehabilitating the physical assets.[12]

Pro Routes: a Practical Example of Operational Performance Improvement

The Pro Routes Roads Rehabilitation and Maintenance programme is an example of how performance improvement outputs can have a positive impact on poverty reduction. The project is working to improve the performance of a roads agency to maintain and rehabilitate a national road network and has been assessed as providing excellent VfM in roads development.

Output: The following outputs have to be achieved in increasing in the strategic roads building rehabilitation programme and managing the social and environmental impacts:

- Cumulative length of roads built and upgraded. Benchmark: 2176 km
- Length of roads maintained and rehabilitated in each year. Benchmark: 2947 km
- Percentage of the reopened roads in good to fair condition. Benchmark: 80%
- Effectiveness of the management of protected areas, averaged over the three areas in the programme zones. Benchmark: 58 ha
- Number of Ministry of Environment and Congolese Wildlife Authority staff trained in implementing laws and accompanying local initiatives. Benchmark: 400 people

Outcome: The target is to re-establish lasting road access between provincial capitals and districts and territories in four provinces in a way that is sustainable for people and the natural environment. Below are some of the benchmarks for 2016:

- Number of days/year when ProRoutes roads are not passable by 4x2 vehicles along the full length that has been built, upgraded, maintained or rehabilitated. Benchmark: 84 days per year
- Percentage increase of daily freight traffic over the baseline averaged over the four project roads. Benchmark: increase is expected to reach 183%
- Share of total rural population in ProRoutes areas that have access to an all-season road. Benchmark: the share is supposed to increase from 0% to 5.4% of population
- Number of people living less than 2km from ProRoutes roads. Benchmark: this number is expected to rise from 0 to 510,000

Impact: ProRoutes Project aims to reduce poverty by establishing lasting access to economic and social services. Relative success is measured by assessing:

- Transport costs between key towns
- Household income and expenditure
- Percentage of DRC's high priority road network (15,800km) in good to fair condition. Benchmark: 39%
- Percentage of children in ProRoutes provinces with fever who seek treatment in a health centre or clinic. Benchmark: e.g. in Orientale province this should reach 58%

There may be an overlap in analysing VfM of performance improvement activities and capacity building (above). For example, improving maintenance systems usually requires a substantial training/capacity building component. In addition, in analysing performance improvement activities, it is critical to assess the potential extent of political or union opposition to changes in operating practices, particularly where these require staff redundancies and to define and cost the communications plan or other consensus building measures that will be needed to address these.[13]

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[11] The World Bank Africa Infrastructure Country Diagnostic estimates that US$17 billion a year could be saved in Africa alone by using existing resources more effectively.

[12] See Briceño-Garmendia et al, (Overhauling the Engine of Growth) AICD #15.

[13] Cf. *PPIAF Consensus Building Report and Labour Toolkit*.

To assess the efficiency of performance improvement projects **the first step is to define the scope of the outcomes expected**. For this, it is critical that the outcomes are expressed as actionable, efficiency gaining targets for improving specified areas of operation. For example, implementing a HDM-4 road maintenance system will help identify the highest VfM repairs, but it is important to also identify the expected outcomes and long-term impacts of this type of project in terms of improving travel times between cities, or reducing the costs of vehicle repairs, etc.

Secondly, VfM can be calculated through specific **cost benefit analysis**. This calculation should take in account the value of the outcomes over the period during which their impact can reasonably be expected. It should also be revised periodically against the benchmark and milestone targets as the improvement plan is implemented.

Finally, it may also relevant to estimate VfM outcomes of a project for the **profitability of the infrastructure operators**. The rationale for carrying out this analysis is that, the infrastructure operating companies will only be able to improve services and access if they are able to earn sufficient profits to remain financially sustainable. Estimating company profitability will be approximate and will depend of the availability of reliable financial information and the impact of exogenous factors on the overall financial results on the company.

VfM indicators with performance improvement activities should highlight n the financial benefits flowing to government and operators – such as government budgetary savings and private operator profitability. For more on indicators, see Annex 2.

The below table provides examples of various ways to measure VfM in performance improvement activities.

Table 8. Measuring VfM in Performance Improvement Activities

Economy	Examples of What to Measure	Key Considerations
	» Aggregate project against planned or benchmarks. » Cost per output against benchmarks » Independent assessment of delivery agent's procurement and contract management capacity » Evidence of minimal sunk costs of existing equipment/cost sharing » Evidence of quality indicators of operations and works » Quality factors, such as proposed approach to construction supervision, environmental and social impacts, on-going maintenance, etc. » Cost of equipment, systems and processes » Evidence of scale economies » Local procurement and transport costs where possible » Competitive tendering policies for sub-contractors	» Infrastructure maintenance contractors are well established in developing countries » The costs are very contingent upon circumstances. » A standard cost benefit analysis will determine if project makes economic sense
Efficiency	**Examples of What to Measure**	**Key Considerations**
	» The transparent and competitive procurement of service providers (often this process is ripe with corruption and inefficiencies in developing countries). » Standardization of procurement, contacts, and performance standards » Worker hours required to produce maintenance plans	» There is a lot of room for efficiency gains in maintenance planning
Effectiveness	**Examples of What to Measure**	**Key Considerations**
	» Performance improvement vs. baselines ▪ Volume of output, e.g. electricity generated ▪ Service quality, e.g. outage days ▪ Service coverage, e.g. households connected ▪ Labour productivity, e.g. output or connections per employee ▪ Collections, e.g. % of output sold or invoiced » Profitability of infrastructure operators » Government budgetary savings	» There is a lot of "long hanging fruit" for donor assistance » Small amounts of donor funding can have a large, long-term impact.

2. Applying VfM to Infrastructure Facilities

2.1. Infrastructure Facility Models

Donors have developed a range of institutional models to initiate and manage infrastructure development activities. One of the most common, of which DFID is one of the leading pioneers, is to channel resources through specialized infrastructure facilities which are mandated to invest in or support specific sectors, issues, or regions. These infrastructure facilities include bi-lateral programmes (e.g. the Nigerian Infrastructure Advisory Facility NIAF), multi-donor programmes (e.g. PIDG), or multi-donor trust funds (e.g. PPIAF). In most cases, the management of the infrastructure facility is outsourced – e.g. to private investment management companies (in the case of project financing facilities) or to a dedicated Programme Management Unit (PMU) often in the World Bank, or other multilateral development agency. In either case, the contracted managers are responsible for initiating and managing the TA and/or project finance activities on behalf of donors.

A main reason for donors to channel funding through an infrastructure facility, as opposed to invest in several stand-alone activities, is to more efficiently use resources, and thus increasing VfM. Dedicated facility PMUs, especially when the infrastructure facility is focused on a particular sector or issue, can achieve economies of scale and specialization through hiring full-time specialists who apply their technical skills across a range of activities. From an internal perspective, donors are able to appraise and subsequently monitor the overall infrastructure facility (as opposed to on each individual activity) and therefore can focus on the big picture of what they are trying to accomplish.

Many donors believe it is more efficient and therefore better VfM to support TA and project finance activities through dedicated infrastructure facilities.

Donors can channel funding to infrastructure facilities in a variety of forms: using direct grants, blending grants, matching grants, challenge funds, seed funds, and to a lesser extent by providing in-kind contributions (e.g. donor staff secondment). The funding mechanism will largely depend on the needs of the infrastructure facility and the risk appetite of the donor. Regardless of the type of funding, measuring VfM of infrastructure facilities requires an additional level of analysis to assess the aggregate performance of the infrastructure facility's activities and its portfolio of projects as well as the VfM of infrastructure facility management structure vis-a-vis alternative approaches.

Some examples of infrastructure facilities and their respective areas of focus are:

Table 9. Sample of DFID supported Multi-Dimensional Infrastructure Programs					
Program	**Activities**	**Sector Coverage**	**Geographic Coverage**	**Stakeholders involved**[14]	**Management Type**
CLIFF	Project Finance	Urban infrastructure	India, Kenya, Philippines, Nepal, Angola, Zimbabwe, Malawi, West/Central Africa	SIDA; Homeless Int.; Implementing partners in active countries – civil society[15]	Contracted out to independent service provider
DRC MDF	Project Finance	Roads	DRC	Government of DRC UNOPS	UNOPS, and a private sector project manager, in coordination with UN
EAIF	Project Finance	Private participation in all economic infrastructure	Sub-Saharan Africa	PIDG Trust Private Banks KfW, others	PIDG Trust contracted out to independent service provider
EU Africa Infra TF	Project Finance; Preparation and Development; Capacity Building	Energy; Transport; Water; ICT	Sub-Saharan Africa	EU donors; EC; EIB; AfDB; Regional African Economic Comm. and other regional orgs[16]	European Investment Bank
GPOBA	Preparation and Development; Project Finance; Performance Improvement	Private participation in all economic infrastructure	All developing countries	Selected Bilateral donors[17]	Dedicated PMU in World Bank
NIAF	Enabling Environment; Capacity Building; Preparation and Development OPI	Power; PPP; Transport; Climate Change; Urban Development; Infrastructure Delivery and Planning	Nigeria	Government of Nigeria and selected State governments	Dedicated PMU contracted out to independent service provider
PPIAF	Enabling Environment; Capacity Building; Preparation and Development	Private participation in all economic infrastructure	All developing countries	ADB, EBRD, World Bank, IFC, Millennium Challenge Corporation Selected bilateral donors[18]	Dedicated PMU in World Bank

For a detailed case study on one bilateral infrastructure facility (Nigeria Infrastructure Advisory Facility (NAIF), see Annex 5. Example of an Infrastructure Facility Model.

2.2. VfM Considerations for Infrastructure Facilities

Establishing widely accepted VfM criteria for infrastructure facilities presents some unique challenges. First, the oversight of multi-donor infrastructure facilities may require compromises between the stakeholders involved, and VfM indicators need to take into consideration their varied organizational development goals. Secondly, once VfM evaluation criteria are agreed, donors should define how VfM should be measured, who will measure it, and who is accountable for success/failure to achieve desired outcomes. Thirdly, the relative diversity of a facility program's activity makes it more difficult to analyse VfM on a facility wide level. While benchmarks are available regarding administration costs, infrastructure facilities vary in size and scope, so a better method to measure overall VfM on a facility level is to look at its cost-efficiency relative to alternative methods of delivery in the same countries and sectors.

14 At end 2011.

15 For details please refer to CLIFF Annual Report 2010 (http://www.homeless-international.org/Files/HOM/PDF/A/A/E/cliffar11_final_39021_1.pdf).

16 ECOWAS, CEN-SAD, COMESA, SADC, IGAD, AMU, ECCAS, EAC, ECA, AUC.

17 http://www.gpoba.org/gpoba/donors.

18 Australia, Austria, Canada, France, Germany Japan, Netherlands, Sweden, Switzerland, USA.

Donors should take the lead on establishing VfM concepts and objectives into the overall operational frameworks of infrastructure facilities, making sure that all stakeholders are held accountable for the VfM outcomes that they can influence, and measuring the VfM performance of the infrastructure facility vis-a-vis alternative approaches of delivery.

The table below provides an overview of the main stakeholders' roles in facilities:

Table 10. Stakeholders Roles in Infrastructure Facilities

Stakeholder	Main Role	VfM Considerations
Donors	» Provide funding » Establish governance and M&E requirements » High-level oversight and guidance	» Making sure VfM objectives and indicators are engrained into day-to-day PMU management » Finding partner programs and funders to create leverage effects » Using influence to persuade governments towards desired outcomes
Private Sector	» Managing programs (EAIF, InfraCo) » Supervising program delivery (EIAF/ GuarantCo – involved in Credit Committees) » Leveraging programs funds (GuarantCo, EAIF debt) » Implementing activities (consultants) » Recipients of funding (GPOBA)	» Ensuring adequate balance between developmental impact and profitability. » Remuneration system designed so it provides appropriate incentives for the private sector to achieve donor objectives » Substantial focus is geared towards RBF and performance based contractor
Partner Governments	» Implementing partners (CLIFF, ATF) » Development partners (InfraCo- Signs MoU with Govt. to develop projects /PPP options) » Recipients of funding » Beneficiaries of activities	» Political support is established and maintained » Ability/capacity to implement/manage the program (CLIFF successful experiences in India did not work in Kenya) » Paris/Accra principles are followed in program aid delivery
Non-profits / International Dev. Institutions / Other Third Parties	» Managing the programs (PPIAF, WSP, PIDG Trust) » Implementing activities (IFC Transaction Advising) » Knowledge and best-practice development (ESMAP)	» Ability to efficiently deliver a program with various levels of complexity » Robust M&E system in place to track progress on VfM targets. » Donor facility funding is not cross subsidizing other non-related initiatives.

2.3. Measuring VfM in Infrastructure Facilities

Infrastructure facilities can offer several important VfM potential advantages to donors in delivering support to infrastructure-related activities. In particular, they can:

- Attract additional funding to scale-up bilateral donor programmes;
- Encourage joint approaches to complex developmental challenges;
- Achieve economies of scale in programme management
- Provide a framework for co-ordination among donors.

However, a Business Case for using an infrastructure facility to implement a particular programme should be supported by an informed assessment that the advantages (benefits) outweigh the disadvantages (costs) in VfM terms. A first consideration when appraising infrastructure facilities is the administrative overhead of the facility relative to other options. Infrastructure facility PMUs generally involve overhead costs for services related to:

- Trustee and Fiduciary Functions: Financial and investment management, legal and contractual relationships, payments to sub-contractors for activities, etc.
- Relationship Building and Outreach Functions: Management of institutional/government relations, advocacy for policy development, development and management of facility brand, etc.

- Secretariat and Coordinating Functions: Organizing agency/donors meetings, attracting new donors, representing donors at events, etc.
- Monitoring, Evaluation, and Reporting Functions: Overseeing the progress of individual activities, reporting to donors, monitoring outputs, outcomes, and impacts, etc.

For the above services, investment managers of project financing facilities generally charge fees based on some combination of three main cost elements, typical in private sector fund management:

- Management Fee: For example, a fixed management fee based on (e.g. 2%) of assets under management – to cover the fixed costs of administration.
- A Carried Interest: For example, a performance-based fee of 20% of fund profits (above a specified hurdle rate) once all investments are sold (a 20% carried interest could also be converted into an "annualized" performance fee of around 3% of fund assets).[19]
- Direct Operational Costs: For example, buying transportation, paying for hotels, etc.

The above cost elements relate to the facility management arrangements, whereas the fees and costs associated with specific activities come under project budgets.

Some examples of administration costs and fees for overall facility management include:

Table 11. Administration Costs as a Proportion of PPIAF's Programme Expenditures ($USD millions)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Activities	9.3	12.1	13.5	13.6	15.6	16.7	13.2	17.3	20.9	11.3
Programme Management	2.6	2.4	2.1	2.2	3.0	2.8	2.9	3.7	3.3	2.3
Total Programme Expenditures	11.9	14.5	15.6	15.8	18.6	19.5	16.1	21.1	24.1	13.6
Management as a % of Total	22%	17%	13%	14%	16%	14%	18%	18%	14%	17%

Source: PPIAF Strategic review 2008

Table 12. IBRD/IDA
Fees as percentage of total annual contributions to the Fund

	Managing Unit Fee	Central Unit Fee
Standard Fee for TFs* (including Bank executed, Project Preparation Small Co-Financing)	3%	2%
Customized Fee for TFs 2/ (including other recipient executed and hybrid TFs**	Customized arrangement	0.75% - 2% (depending on the TF size)

* Standard fee trust funds also incur an additional one-time setup fee of US$35,000.
** "Other Recipient Executed" TFs includes large co-financing trust funds ≥ $30 million. Hybrid Trust Funds are defined at the trustee level and would include any combination of Bank Executed and Recipient Executed activities, or transfers to outside agencies.
Source: World Bank

[19] Assumptions as follows: (i) 20% carried interest, (ii) a portfolio IRR of 10%, (iii) a seven-year "hold" period on investments, and (iv) a 6 percent discount rate for the fund manager.

Table 13. Trust Management Fees* US$		
	2009	2010
As percentage of total Capital Account at year end	0,15%	0,15%
As percentage of total Trust expenditures	7,13%	7,58%
As percentage of capital contributions received during the year	0,5%	0,8%

* It includes Annual Management fee, Multiconsult Trustees Management fee and a Minimax Management fee
Source: PIDG Trust Financial Audited Accounts 2010

It should be noted that some infrastructure project financing facilities (e.g. EAIF, GuarantCo) mobilize funds from commercial and other sources to supplement donor funding. In this way, project financing facilities can leverage private sector capital to co-finance infrastructure projects. For GuarantCo, for example, it has created a facility with commercial lenders to increase its capacity to offer guarantees up to four times the paid-in capital. The capacity for mobilizing commercial funding is an important potential advantage of project funding facilities if it can be demonstrated that the additional capital would not have been invested in the absence of this intermediary.[20]

The economy, efficiency, and effectiveness criteria for evaluating the VfM of infrastructure facilities should be adapted to the type of infrastructure facility. In general, the approach should take into account (i) how aggregated inputs are transformed into outputs by the facility and (ii) administration and overhead elements related to overall program efficiency. For example, a technical assistance program such as PPIAF, which finances a large and diverse portfolio of small grants and is not intended to generate revenue, does not compare well to an investment fund such as GuarantCo that undertakes a relative small number of homogeneous transactions (credit enhancements). Similarly, global facilities are likely to have higher administrative costs than a fund focused on single country.

Infrastructure facilities are not all the same – some focus on complex sectors, operate in challenging countries, and/or have larger portfolios. Thus, administrative costs ratios vary considerably and direct comparisons should be used with care as indicators of VfM performance.

However, there are some common VfM themes that apply to most infrastructure facilities. In many cases an important objective is to attract private sector financing in addition to donor funding for infrastructure development, particularly in low income countries. Secondly, successful infrastructure facilities can have a demonstration effect in encouraging increased confidence of investors to fund infrastructure or more positive perceptions of private participations among government officials. Finally, infrastructure facilities are intended to have a cumulative impact, and therefore may be judged on a portfolio-wide basis.

The below table provides examples of ways to measure VfM for overall facility performance.

[20] For a discussion of World Bank Methodology for measuring leverage, see World Bank Group Sustainable Infrastructure Action Plan, July 2008, Annex 3.

Table 14. Measuring VfM in Infrastructure Facilities		
Economy	**Examples of What to Measure**	**Key Considerations**
	» Comparison against fund management norms / comparators » Facility administration as % of total expenditures » Facility administration costs per activity » Annual costs compared to budget » Level of management remuneration relative to industry norms » % of Full Time Equivalent (FTE) costs of donor staff time » Cost breakdowns between salaries, travel, overhead, etc. » Sensitivity and scenario analysis if fees/costs are performance based (to estimate across potential outcomes)	» It is major decision to initiate or contribute to an infrastructure facility. Once the decision is made, there is usually a 5 year+ commitment and reputational risks » The most critical economy VfM indicator will be a comparison to the costs of alternative methods, which require additional research.
Efficiency	**Examples of What to Measure**	**Key Considerations**
	» Mid-term reviews / evaluations » Actual vs. approved costs » Average cost per project/intervention, and comparisons to similar facilities » Leverage ratio (non-donor funding as % of total) » Cost per person/households connected » Time for project approvals compared to donor norm » Surveys on brand recognition and quality	» A World Bank assessment of global and regional partnerships,[21] found that about half were adversely affected by inefficient management and oversight (i.e. weak resource mobilization strategies, poor governance and management, failure to keep up with the changing global and regional context, difficulty in demonstrating results).
Effectiveness	**Examples of What to Measure**	**Key Considerations**
	» Annual M&E costs as % of total expenditures (i.e. does the facility itself know how effective its activities are) » M&E costs comparison with benchmarks (would want to be above average, as facilities traditional under-fund M&E) » % of new activities approved incorporating VfM analysis. » Activity outcome success rate (% of total activities) » Number of people/households connected (annual and cumulative over project lives) » Cost per measure of outcomes	» Outcomes and impacts can be judged on a high level (e.g. country level), as a facility general has broad influence and integrated activities that influence impacts » Facilities need to continuity and security in funding to operate effectively. Donor evaluations, and subsequent decisions to renew, wind-down, scale-up, scale-down, etc., should be made well in advance of facility termination dates

Sustainability assessment of PIDG by the Multilateral Aid Review

The Multilateral Aid Review indirectly assessed PIDG future sustainability by stating that “PIDG has delivered strong development results on the 'frontier' in DFID priority countries and offers very good value for money for the UK’s aid budget. Through its allocation of risks within the various facilities, the PIDG has the potential to scale up substantially and improve its ability to attract and find new and innovative ways for the private sector to invest in the poorest countries, demonstrating that viable, decent returns can be made in providing sustainable affordable services to their populations.”

(Source: The MAR Multilateral Aid Review 2011)

The Afghanistan Reconstruction Trust Fund (ARTF)

The ARTF is an MDTF fund administered by the World Bank and funded by 27 donors, including DFID. It was established in 2002 to provide funds for the government’s budget, investment activities and programs including quick-impact recovery projects such as government training programs, covering as well the urban infrastructure sector. ARTF provides approximately half of the government’s non-security operating costs and over a quarter of its development expenditures. Recently, donors agreed to extend the ARTF until 2020. This reflects an on-going commitment by donors to utilize the ARTF mechanism, and an acknowledgement of the development challenges that remain in Afghanistan.

(Source: DFID, Working Effectively in Conflict-affected and Fragile Situations, Briefing Paper F: Practical Coordination Mechanisms, 2010 and UN Mission Report, 2010, http://www.fas.org/sgp/crs/row/R40747.pdf)

[21] IEG, Independent Assessment, The World Bank’s Involvement in global and regional partnerships, 2011.

3. Applying VfM Through the Project Cycle

As already emphasised, for the VfM approach to be effective it should be applied throughout the project life, although the focus and methods of analysis need to reflect the successive stages of the cycle.

3.1. Identification Stage

During the Identification Stage, VfM analysis has an important role in establishing the Business Case for the commitment of resources. At this stage, a robust estimate of the costs of the activity should made based on financial data gathered from comparable activities, quotes and estimates from potential suppliers, and other forms of benchmarks. This preliminary cost assessment, coupled with a preliminary assessment of the expected benefits, should provide an early indication of the overall VfM of the proposed activity, and highlight areas where VfM can be improved. Key early questions to ask include:

- **Benchmarking** – Have you reviewed the costs vis-a-vis quality of similar activities already procured by your donor organization? Have you reviewed costs vis-a-vis quality of similar activities already procured by partner/other donor agencies, and contacted these agencies for background on pricing? Have you begun gathering basic pricing information from potential implementing agents to determine the range of their costs? While gathering this information, are you building up a database of cost benchmarks broken down by expertise, location, etc., which you can use for future activities?
- **Ensuring a Quality / Cost Balance** – Are you satisfied that potential implementing agents are optimizing their rates, and striking a balance between cost and quality, particularly for specialist skills, like engineering, legal, environmental impact analysis? Have the agents provided a rationale for their costs? Does the design of the activity have a realistic needs assessment, avoiding 'over design' and optimism bias in forecasting? (e.g. building roads in a low income country that are actually suitable of middle income country levels of traffic)
- **Facility Management Fees** – Have you benchmarked the fund management fee with current practice similar funds in similar contexts, bearing in mind the substantial differences between project financing and technical assistance activities? Does this include an appropriate performance related component? Should the structure of the facility incorporate results based financing (RBF)?
- **Procurement Approach –** Do you have a good understanding of the best procurement approach, and does it offer competition and cost effectiveness? For procurement criteria, are these wider than just cost, for example, do they cover issues such as reliability of delivery? Are there any performance based components that could be incorporated into the procurement approach?
- **Economies of Scale** – Do the potential implementing agents have existing equipment or on-location personnel that it can draw upon at relatively low incremental cost? Have the agents provided any evidence of scale economies, locally sourced commodities, or lowest cost commodities? Is there evidence of volume discounts? Do the potential implementing agents have a variety or potential suppliers or are they captive to only one supplier?
- **Economies of Scope** – Does the activity require skill sets that are uniquely distinct of can some of the agents' team members perform a variety of functions? Is there evidence that unit costs are lower as they are spread over more than a single purpose (e.g. water pipes and water treatment plants)?

In addition, another key approach at the Identification Stage to determining VfM is **Cost Effectiveness Analysis (CEA)**. CEA focuses on collecting or compiling unit cost measures – for example, cost per beneficiary, cost per km of road built, cost per unit of $C0_2$ saved, etc. It is a useful tool for comparing various options for delivering a given outcome. It can also be useful when there are standardised international or national benchmarks for the parameters used. CEA also can be applied during the Implementation Stage, particularly for a large programme comprising fund a number of similar activities, such as cost per feasibility study, cost per water connection, etc.

CEA is not useful in all cases, however, and works best when there is a linear relationship between inputs, outputs, and outcomes. For example, the CEA methodology can be misleading if the association of costs to outcomes depends on other factors or if costs are fragmented across several potential outcomes. In addition, small scale interventions, as well as innovative and pilot approaches, are likely to show higher unit costs, but may still be highly effective in their own terms. Actions which are costly, but vital to success (such as coordination of agencies) may be disadvantaged if cost benchmarks were applied too rigidly.

Table 15. Cost Effectiveness Indicators

Investment	Objectives
Roads	Cost per km of road construction Cost per km of road maintenance Cost per green job created Cost per household accessed Cost per business accessed Cost per supplementary infrastructure (e.g. bridge, footpath)
Power (Grid Based)	Cost per tonne of carbon averted (any figure below the cost of carbon, around £14) is deemed as cost effective Cost per DALY (health benefits due to air quality improvements) Cost per green job created Cost MW of installed capacity Cost per beneficiary accessed Unit costs of operation and generation (per kwh) Fuel efficiency Kwh per gallon of diesel/oil/unit of gas consumption Frequency of power outages (% availability of plant) Reductions in productivity losses by businesses Cost per incremental household accessing energy (off grid only)
Water	Cost per DALY averted Cost per green job created Cost per incremental household accessing energy
Irrigation	Cost per ha of irrigation construction Cost per m3 of water supplied Cost per DALY averted Cost per job created Cost per unit of land productivity increase (kg/ha) Cost per productivity increase of irrigated land (kg/m3)
ICT	Cost per computer room Cost of setting up internet connection Cost of establishing mobile access per household Cost per ICT training per person Cost per 1% increase in election participation

Table 16 illustrates the unit costs of construction by sector and by type of project. Table 17 shows the unit costs of maintenance and rehabilitation in roads and irrigation sectors, which gives a benchmark of the future operation costs of infrastructure.

Table 16. Unit Costs of Construction by Sectors			
Sector	**Project type**	**Construction Unit Cost**	**Unit (US$2006)**
Roads	Construction (paved) <50km	401,646	US$/lane km
	Construction (paved) >50km	290,639	US$/lane km
Power and energy	Generation – high speed diesel	822,864	US$/MW
	Distribution <66kV	8,278	US$/line
	Transmission >66kV	27,632	US$/line
	Substations <50MVA	205,682	US$MVA
	Substations >50MVA	68,865	US$MVA
	Service connection	806	US$/conn
	Service connection with street lighting	609	US$/conn
	Street lighting	1,767	US$/conn
Water	Wells – no pump	6341	US$/well
	Wells – electric pump	37429	US$/well
	Wells – electric and hand pump	13959	US$/well
	Pipe – small diameter	26	US$/m
	Pipe – midsize diameter	144	US$/m
	Pipe – mains	457	US$/m
	Reservoir construction – steel	1067	US$/kl
	Service connection – yard	24	US$/conn
	Service connection – standpipe	282	US$/conn
	Latrines – public	19659	US$/conn
Irrigation	New Construction (Unit Total Cost)	16923	US$/ha

As early as the Identification Stage, **Cost Benefit Analysis (CBA)** can also be a key tool for measuring effectiveness *ex-ante*. The goal of a CBA is put a valuation on the benefits of an activity, which is similar in concept to putting a monetary value on the outcomes. Key elements include:

- **Capturing all of costs involved**. This should include the scale of the direct and indirect resources, including donor staff costs for time and resources, total consultancy costs, and other resources used (e.g. energy, waste, etc.).
- **Unbiased and conservative forecasting of benefits.** CBA relies on objective analysis in estimating results as forecasting is characterised by strong optimistic biases (i.e. to underestimate costs and overestimate benefits). This is particularly true for infrastructure activities as they have a large pool of potential beneficiaries (e.g. the number of road users, number of households directly benefiting from an off grid energy project, etc.). Indirect benefits in particular should be given a very conservative attribution.
- **Conservatively measuring the scope of beneficiaries**. In donor funded infrastructure programming, there is a tendency for the geographic scope of to be expanded as they develop. The belief is that the activity can relieve a "bottleneck" in a broader (e.g. regional network) and therefore offer potential for overall system efficiency improvements. These gains should not be assumed uncritically and CBA should focus on evaluating the direct regional benefits and only take into consideration overall network efficiency gains on a limited scale.
- **Sensitivity analysis to stress test assumptions**. The analysis should test results based on alternative assumptions for parameters that are characterised by uncertainty, such as shadow prices of water, carbon, power (kwh), prices of commodity costs, number of beneficiaries (direct and indirect), discount rate, unit costs (e.g. cost per km road).[22]
- **Adjusting "market" pricing**. Values in a CBA model are often derived from local market prices. These are rarely perfect – externalities are not factored in (e.g. climate change) and wage rates

[22] These are market prices converted to economic prices to reflect real resource values. They usually exclude taxes and other transfer payments and provide adjustments for market distortions.

may be based on poorly functioning labour markets. 'Good' economic analysis requires an analysis of the functioning of the markets from which the values have been taken and should not accept at face value current market prices.

- **Determining baselines**. The accuracy of CBA is also reduced in the absence of suitable baseline data, particularly for infrastructure sectors in rural areas (e.g. number of households that are grid connected, current household water consumption, etc.). In these cases, the results of the analysis should be used cautiously.
- **Cost attribution**. Many different resources outside the programme often contribute to benefits in infrastructure facilities – such as other donor support, support from private finance, existing plant and machinery, etc. These need to be accounted for in matching costs and benefits, so that the programme funding only takes credit for its contribution to resources.
- **Theory of change**. To what degree does the provision of infrastructure, (e.g. the construction of roads) lead to better gender outcomes, or better security, or better access to basic services? Whilst the empirical evidence may indicate a positive correlation between road use and improved service access, attribution will be difficult to measure. Ex-post impact evaluations are generally provide more valuable evidence to understanding the links in the theories of change better.

Table 17. Effectiveness indicators from Transport sector projects

	Nepal roads (DFID)	Roads in Congo (DFID)
Budget	£9.4m	£19.5m
NPV	£5.1m (12% discount rate)	$6.4m
IRR	16%	19%
BCR	1.7	1.3
Number of beneficiaries	175,000 people	-
Employment days created	3.1m	-
Decrease in interest rates	60% to 30% from money lenders due to competition	-
Asset creation	50 acres of land purchased	-
Changes in wages	100% increase	-
Impacts on the mining industry		$6.6m per annum (5% attribution rate)

Table 18. Effectiveness indicators from Water sector projects

	Zambia Water and Sanitation cross border projects (DFID)	SADC Water: Kunene Dam Construction Project	Emfuleni Water Conservation Project (SADC water)	Armenia Municipal Water Project (World Bank)
Budget	£11.7m	24	£15	$18m
NPV	£24.4m	77.6	£15	$6.6m
BCR	2.3	4.3	2.2	1.4
EIRR				26%
Number of beneficiaries	14,000	25,000 households	330,000 households	133,000
Health benefits	4.6	4.3	-	
Opportunity cost of time	5.8	22.3	-	
Consumer surplus (Extra water access for households)	1.3	-	-	
Household savings due to cheaper access	24.6	-	-	

Case study: The Kunene Trans-boundary Water Supply Project

An example of a project which used a CBA methodology to determine its VfM is the Kuene Trans-boundary Water Supply Project. The project provided increased access to water and sanitation in Namibia and Angola. With a total implementation costs £23.8m, the benefits were assumed to accrue over 20 years.

The intended outputs were:

- To establish delivery of water to specific towns. Benchmark: to establish a permanent delivery of a minimum of 74 m³/h of potable water to the Angolan towns of Santa Clara, Namacunde, Omupanda and the Provincial Capital Ondjiva.
- Water pipeline construction. Benchmark: to complete the 40 km pipeline between Santa Clara and Ondjiva
- The Calueque Dam pump station and intake at the Kunene River in Angola are to be upgraded and refurbished
- To construct a water treatment plant and a distribution system to supply water to the Angolan village of Calueque
- Establish an electricity supply for the pump station in Santa Clara will also be provided
- Design and construct a new sewage network and wastewater treatment plant in Ondjiva

The CBA for the feasibility study metrics included:

- Cost of study – £1m
- Cost and Administration Overhead – £1.2m
- Economic Cost of Study, based in 50% failure rate of fund – £2.4m
- Attribution based on contribution of project prep docs to total cost – 5%
- Attributable benefits based on 5% of investment benefits – £4.9m

Based on CBA, it was determined that the Net Present Value of the project was a positive £2.8m.

3.2. Design Stage

The Design Stage of an activity is concerned with defining the scope in more detail, and the procurement, delivery, governance and management processes required to achieve the intended outputs, outcomes, and impacts. This should provide a more robust basis for assessing whether these will ensure the optimal use of resources to achieve maximum VfM.

By the end of the Design Stage**,** systems need to be in place to show how the activity will deliver good economy, efficiency, and effectiveness (e.g. sound financial / procurement systems; robust theory of change; intervention design, approval, and monitoring systems, etc.) These should include steps to ensure sufficient data collection and reporting for monitoring VfM as follows:.

- **Identifying and assessing options to minimize input costs** (alternative suppliers, methods of procurement, project management, QC processes, technical options, etc.) based on assessing these costs against benchmark data from similar activities.
- **Identifying output milestones** to define the expected timescale for measuring progress during implementation.
- **Considering contractual arrangements that include safeguards and incentives,** such as results-based financing, for activity service providers and managers to operate economically and efficiently.
- **Indicating the operational steps and management processes** needed to implement the activity, including assumptions, risks and stakeholder support needed/obtained and operational management and activity monitoring systems after start-up.
- **Factoring in the design a VfM M&E Framework** for the duration of implementation so that data and statistics and can be gathered and analysed to allow VfM conclusions to be drawn.
- **Factoring in the design and budget an *ex post* impact assessment** to evaluate the activity and draw lessons about VfM to guide appraisal and implementation of future investments.

The Design Stage should also address the issue of **sustainability** (i.e. whether and how the activity is intended to continue to operate or generate benefits over time). To assess sustainability one must consider the long-term relevance of the activity, and the prospects for it to become financially sustaining. VfM analysis should also take into account the long-term sustainability of the activity after the donor's involvement, and identify a strategy for devolution or exit based on the expected continuing costs and benefits of the activity.

Table 19. Applying VfM during the Development Stage (i.e. Identification and Design Stages)

Key VfM Tasks	Metrics/Indicators	Sources/Examples
Economy		
» Identify and quantify all significant input costs (human, material and financial) for DFID and partners and associated risks. » Breakdown project costs into key components (including set, delivery, project governance, management and M & E) and baseline values » Identify valid benchmarks for consultancy rates, unit commodity costs, administration costs, fund management fee rates » Look for procurement policy documentation and evidence of VfM » Look for organisational cost conscious behaviour	» Aggregate £ and proportion attributable to DFID and other partners » Unit costs of major inputs » Model cost classification » Management: Delivery Cost Ratio » M & E cost, and ratio (% of total) » Competitive tendering	» PPIAF, approach to defining management and delivery costs » VfM Cash Transfer Programs » PPIAF Consensus Building » RONET estimate estimated costs of road maintenance and rehabilitation under » Multilateral Aid review
Efficiency		
» Look for organisational attributes – systems and processes of efficiency and productivity » Build in contractual safeguards » Collect CEA measures » Embed indicators for CEA » Be aware of efficiency in design	» Good financial resources management; » RBF » Cost per km or road built; cost per cubic meter of water piped, cost per household accessed » Ensure that design is fit for purpose of country context	» Multilateral aid review » See Annex 1 on CEA examples » E.g. roads are built for local traffic forecasts rather than international standards
Effectiveness		
» Identify key outcomes and target beneficiaries and linkages (theory of change) » Use specialist sector guidance for valuation techniques for benefits » Be aware of optimism bias in forecasting impacts » Identify pivotal parameters and undertake sensitivity analyses in the modelling to mitigate uncertainty » Take care with determining cost attribution » Consider equity, in terms of beneficiary targeting	» Capacity installed » Capacity utilization » Access (households served) » Improvement in operator productivity » Tax revenues to host government » Increase in employment (construction, operation of utility) » [endorsement of key policies and/or actions] » Shadow prices, unit cost assumptions, » Cost attribution is a function of cost contribution, theory of change assumptions » E.g. targeting of poorest households that are not grid connected rather than a cross section of households (in an energy programme)	» Ten Steps, Ch. 2 Selecting Outcomes » Ch. 3 Selecting Key Indicators » Infrastructure and Pro-poor growth (briefing note 4, Apr 2006) » PPIAF Impact Story on Uganda water » Sector productivity indicators (see box) » PIDG Results Monitoring Handbook, 2010RONET revenue model evaluates revenues from road user charges and funding requirements » Measuring Change and Results in V & A work, December 2009 » See HMT Greenbook guidance for optimism bias » Split between operating and capital expenditure is important in cost contribution estimations

3.3. Implementation Stage

The Implementation Stage of an activity is concerned with the mobilization of inputs and delivery of outputs to achieve intended outcomes. This part of the project cycle involves applying the VfM M&E Framework to collect, process, and analyse data defined during the Identification and Design Stages.

The goal of the VfM M&E Framework is to ensure that VfM is actually delivered throughout the project lifecycle. This does not necessarily need to be a stand-alone tool; but should provide a means to track VfM specific indicators and may be embedded in standard M&E tools, such as the logframe.

The key issues for optimizing VfM during implementation are as follows. First, it is important to ensure that the mobilization/delivery processes are being managed to meet the standard of economy. As implementation is a dynamic process, project management teams need to systematically identify and monitor the costs and benefits associated with their results, and make adjustments when VfM is not being achieved. During Annual Reviews teams should focus on verifying and challenging the soundness of the VfM analysis and the strength of any conclusions being drawn.

Secondly, the lessons learned from monitoring should be systematically fed back into the VfM M&E Framework. The M&E framework within which the metrics are housed (e.g. the logframe, reporting structure, procurement and financial control systems), should be dynamic and continuously producing data to be used to monitor activity efficiency. This should lead to changes to be made to the activity to improve VfM during its lifespan. In general, if the metrics indicate that good VfM is not currently being achieved (e.g. based on progress towards milestones on a per £1 spent or per man day allocated), the team should consider diverting resources from an unsuccessful component to a more successful one.

The table below summarises the key tasks for active programme management.

Table 20. Applying VfM during the Implementation Stage

Key VfM Tasks	Metrics/Indicators	Source/Examples
» Monitor procurement of inputs and project delivery processes (against milestones) to identify potential improvements, and identify and assess reasons for significant deviation in the planned use of resources. » Revise cost targets and procurement and delivery processes where appropriate » Monitor and revise benefit analysis » Actively manage trigger points and exit strategies if necessary	» Progress of procurement and mobilisation of inputs » Compare relative performance » Modify logframes if necessary » Progress towards milestones per £1 spent or man day allocated	» EIB, Guide for Procurement, 2012

3.4. Evaluation Stage

Finally, VfM analysis should be explicitly built into the ex post evaluation process for infrastructure projects. Evaluations can be classified according to the timing in the project cycle. Mid-term evaluation undertaken during the Implementation Stage of the developmental intervention should be used to assess whether a development intervention is being implemented as planned, whether adjustments are required and what factors are likely to influence the sustainability of the activity.

Final/Ex-post Evaluations (or end-of-project) undertaken towards the end of the project cycle and should be used to demonstrate results over the full project time scale. For “upstream” interventions (e.g. related to the enabling environment) evaluations should assess outputs as a leading indicator of anticipated outcomes. At this point, a good analysis of the VfM achieved vis-a-vis the original projections is essential to high light all the lessons to be learned from it.

Table 21. Incorporating the VfM Approach in ToRs for the Final/Ex-Post Evaluation Stage	
Tasks	**Objectives**
Scope and focus of the evaluation	Clearly state the role of VfM in the evaluation and define the evaluative questions to be answered and expected scope of recommendations for improving VfM in this type of intervention.
Evaluation methods and process	Indicate the expected (or minimally acceptable) methodology for assessing VfM, in particular in relation to the quantification of benefits and the required data gathering and analysis, taking into account the availability and quality of existing data.
Deliverables	Describe of expected format and content of the evaluation report, including the extent of detailed presentation of the VfM methodology used and/or the factual evidence in relation to the evaluative questions. Determine whether an inception report is necessary; to be sure the evaluation team has understood the task or if clarifications or changes to the methodology are required.
Schedule	Specify taking into account the extent key tasks of the evaluation, including the extent of data gathering and analysis required to assess VfM.
Evaluation team qualifications	Specify taking into account the extent the balance between technical and methodological skills needed to carry out the key tasks of the evaluation, including and analysis required to assess VfM.
Budget	Specify taking into account the extent key tasks of the evaluation, including the extent of data gathering and analysis required to assess VfM.

When conducting final assessments, it is important to remember that the impact of infrastructure impacts typically extend overlong-term time horizons. In many cases, the full costs of an activity will continue to accumulate years after donor involvement has ended (e.g. on-going operation and maintenance of a road, new employees of a non-revenue generating regulatory agency, etc. Likewise, the benefits of the activity will continue until the infrastructure becomes obsolete (which is rare in growing economies) or needs to be replaced.

Finally, ex post evaluations should address the issue of the sustainability (cross reference section 2.6). In particular, this should include assessing the long-term VfM of a project based on (a) the ability to mobilize future resources requirements; (b) the adequacy of measures taken to provide for ongoing management; and (c) the probability of achieving continued benefits in face of likely changes to market or other conditions.

Table 22. Applying VfM during Final/Ex-post Evaluations		
Key VfM Tasks	**Metrics/Indicators**	**Source/Examples**
Annual and Mid-term evaluation		
» These should assess outputs against logframe indicators » Unit cost measures against agreed benchmarks » Assessment of the general performance of the programme from a VfM perspective » Was the programme cost effective? » Were the impacts as predicted in the ex-ante CBA? » Was the beneficiary targeting accurate? » Has empirical evidence and data been collected that is externally valid? » Was the project management and delivery effective? » Were risks mitigated, as expected in the risk assessment? » Assess feasibility/desirability of scaling project up or down or replicating it in other situations » Did the theory of change stack up? » To what degree can impacts observed be attributable to the programme?	» Length of road construction completed; number of houses grid connected; Number of advisory outputs delivered e.g. sector strategies, capacity building programs » Increase in infrastructure capacity and distribution coverage » Number of households connected » Production of outputs » Timelags » Adjustments necessary to retrofit targets, if, for example forecasting at the business case and design stage was erroneous (e.g. inaccurate data on number of households reached) » Were costs off track » Compare with NPV estimates » Was the targeting tool accurate?	» PIAFF Annual Reports and Strategic Review 2008 » World Bank, Africa's Water and Sanitation Infrastructure, 2011 Ratings of Regulatory Agencies » World Bank Institute, Capacity Development Results Network » OECD, Development Standards for Development Evaluation » World Bank, Handbook on Impact Evaluation, 2010 » AICD: Making Sense of Africa's Infrastructure Endowment: A Benchmarking Approach » PIDG, Results Monitoring Handbook

Annex 1. Summary Tables

Table A 1.1. Sample VfM Considerations Across Infrastructure Activities

	Enabling Environment	Capacity Building	Project Preparation	Project Financing	Performance Improvement	MTDF's and Facilities
Economy	» Consultancy rates » Administration rates » Consultants' credentials / CVs / past performance record » Type of expertise required (the more specialised the professional discipline, the higher cost) » Level of responsibility attached to the assignment » Duration of engagement (long- or short-term) » Difficultly (both physical and reputational) of the post (whether it is in a fragile state or more stable country) » Regional and local market factors » The proposed ratio of costs spent on developing vs. implementing the law/regulation/policy/strategy (sufficient focus on implementing is important)	» Consultancy rates, » Administration rates » Consultants' credentials, with particular regard to direct "teaching" experience » Costs associated with having fulltime resident assistance vs. periodic consultant visits (e.g. expat living costs vs. airfares) » Duration of engagement (long- or short-term) and the available budget to ramp-up if progress is good » Difficultly (both physical and reputational) of the post (whether it is in a fragile state or more stable country) » Regional and local market factors; comparing international advisors with local advisors	» Consultancy rates, » Administration rates, » Consultants' credentials, with particular regard to transaction success experience » Costs associated with having fulltime resident assistance vs. periodic consultant visits (normally international advisors are required) » Difficultly (both physical and reputational) of the post (whether it is in a fragile state or more stable country) » Amount of contract that is performance based payments	» Independent assessment of delivery agent's procurement and contract management capacity » Evidence of minimal sunk costs » Evidence of quality indicators of operations and works » Quality factors, such as proposed approach to construction supervision, environmental and social impacts, on-going maintenance, etc. » Cost of equipment, systems and processes » Evidence of scale economies » Local procurement and transport costs where possible » Competitive tendering policies for sub-contractors	» CBA/outputs directly linked to infrastructure delivery; » Aggregate project against planned or benchmarks. » Cost per output » Independent assessment of delivery agent's procurement and contract management capacity » Evidence of minimal sunk costs of existing equipment/cost sharing » Evidence of quality indicators of operations and works » Quality factors, Cost of equipment, systems and processes » Evidence of scale economies » Local procurement and transport costs where possible » Competitive tendering policies for sub-contractors	» Total Program costs » Costs of Program Management » Trust Fund costs (where relevant) » Program Management Remuneration » M&E costs » Donor staff costs (DFID and others) » Program Delivery costs » Program Management Remuneration » Comparison against fund management norms or comparator facilities » Facility administration as % of total expenditures » Facility administration costs per activity » Annual costs compared to budget » Composition of management remuneration » % of Full Time Equivalent (FTE) costs of donor staff time » Cost breakdowns between salaries, travel, overhead, sub-contractors, etc. » Sensitivity and scenario analysis if fees/costs are performance based (to estimate across potential outcomes)

Efficiency	» Numbers of business policies analysed or implemented per £1m of TA spend » Numbers of laws/regulations analysed or enacted per £1m of TA spend » Population of potential service area per cost per £1m of TA spending	» Cost effectiveness » Numbers of man days spent on-site / embedded per £1m of TA spend » Number of people trained per £1m of TA spend » Number of people using new software / system » Volume of infrastructure service using new software / system (e.g. what % of costumers now receive metered water bill) » Quantity of software installed / people trained to use per £1m of TA spend	» Cost effectiveness (unit costs) » Organisational systems and processes » Cost and timeliness of technical feasibility work (e.g. environmental assessment) compared to international benchmarks » Total PDD study cost as a % of the expected total infrastructure project investment » Number of days to from Expression of Interests to Short-listing to Project Tendering to Commercial Closure to Financial Closure	» Results based contracts » Cost effectiveness indicators » Organisational systems and processes » Portion of payments that are linked to outputs (and even better yet outcomes) » Time frame for completing works » Amount of performance bonds and/or guarantees » Quantity of workers and equipment employed for project	» Delivery of Outputs » Cost Efficiency » The transparent and competitive procurement of service providers (often this process is ripe with corruption and inefficiencies in developing countries). » Standardization of procurement, contacts, and performance standards » Worker hours required to produce maintenance plans	» Program structure and design » Program organizational efficiency » Efficiency of program delivery » Gender mainstreaming » Adoption of VfM objectives and methodology » Mid-term reviews / evaluations » Actual vs. approved costs » Average cost per project/intervention, and comparisons to similar facilities » Leverage ratio (non-donor funding as % of total) » Cost per person/households connected » Time for project approvals compared to donor norm » Surveys on brand recognition and quality » Surveys of repeat clients

Effectiveness	» Proportion of regulations, policies actually implemented; » Reduction in number of days for a project to go through the full project cycle » Value of projects formally entering the new planning or funding system per £1m of TA spend » Time savings (e.g. weeks, days, hours) due to significant improvements in service delivery (e.g. reduction in the number of days for clearance of goods in ports) » Opinion surveys of private project developers	» Learning outcomes » Organisational performance measures » Efficiency gains in operation from the use of new approaches, software, systems, etc. (e.g. reduction in man days needed to develop annual road maintenance plan). » % decline in surveys of service users reporting corruption/bribe paying	» Probability of success of implementation of project construction and finance as a result of preparation products. » The number of bidders in a tender » Whether or not the tender was successful » Whether or not the infrastructure was built » Positive opinions from private companies participating in tenders	» Access to Infrastructure Services, including pro-poor targeting. » CBA/outputs directly linked to infrastructure delivery. » Amount of infrastructure built/ delivered/ /upgraded per £1m investment » Amount of construction risk being taken on by contractor	» Access to Infrastructure Services, including pro-poor targeting. Improved Productivity and Service » Financial Impact » Cost Effectiveness » Non-financial benefits / positive externalities » Performance improvement vs. Baselines » Government budgetary savings	» Financial Leverage » Fiscal Impact » Additionality » Demonstration Effect » Gender Mainstreaming » Project Cost Effectiveness » Access » Fiscal Impact » Annual M&E costs as % of total expenditures (i.e. does the facility itself know how effective its activities are) » M&E costs comparison with benchmarks (would want to be above average, as facilities traditional are under-funding this area) » % of new activities approved incorporating VfM analysis. » Activity outcome success rate (% of total activities) » Number of people/households connected (annual and cumulative over project lives) » Cost per measure of outcomes

Table A 1.2. Applying VfM Through the Project Cycle			
Stage in Cycle	**Key VfM tasks**	**Sample Metrics**	**Key Considerations**
Business Case: » Establishing the rationale for commitment of resources to project/program	**Economy:** » Identify all the costs	» Aggregate £ and proportion attributable to DFID and other partners Unit costs of major inputs » Model cost classification » Management: Delivery Cost Ratio » M & E cost, and ratio (% of total)	» Define the scale of the direct and indirect resources involved –will this be a standalone intervention, a multilateral intervention, or a facility model? » Identify and evaluate options for ensuring VfM » Embed indicators, including baselines and sources of verifiable data, in the project documentation to provide the basis for M&E
	Efficiency: » Identify the outputs and benchmarks	» Cost Efficiency Ratios (Cost per unit of outputs) » Unit costs	
	Effectiveness: » Identify the outcomes and the costs of achieving them	» Capacity installed » Capacity utilization » Access (households connected) » Improvement in operator productivity » Tax revenues to host government » Increase in employment	
Design: » Defining scope of project, choice of technology and project management processes required to achieve intended outputs and outcomes with optimal use of resources	**Economy:** » Find ways to minimize costs	» Identify key cost for chosen mode of delivery	» By the end of the design phase, systems need to be in place to ensure that the project will deliver good VfM. e.g. sound financial / procurement systems; robust theory of change; intervention design, approval, and monitoring systems etc. » The project design should include steps to ensure sufficient data collection and reporting for monitoring VfM. » In addition, the design phase should also address the issue of sustainability, i.e. whether and how the project is intended to continue to operate or generate benefits over time
	Efficiency: » Identify options for implementation and delivery of outputs	» Quality and timeliness criteria	
	Effectiveness: » Identify and assess options for ensuring project outputs	» Comparison of relative cost and performance of alternative forms of delivery, including private participation	
Implementation: » Ensuring mobilisation of planned resources and procurement of inputs to achieve project outputs	**Economy:** » Monitor procurement and costs	» Progress of procurement and mobilisation of inputs against target » Compare relative performance against benchmarks	» The M&E framework within which the metrics are housed (the logframe, reporting structure, procurement and financial control systems) should be dynamic and continuously producing data. This allows changes to be made to the project as it unfolds to improve VfM during the programme lifespan if the metrics indicate that good VFM is not currently being achieved in a certain area
	Efficiency: » Monitor progress	» Progress towards achieving expected outputs, as defined in » Logframe	
	Effectiveness: » Monitor potential impact of progress in implementation on achievement of outcomes	» Cost Effectiveness Analysis	

Monitoring & Evaluation: » Assessment of performance of completed projects in delivering intended outcomes with optimal use of resources	**Economy:** » Evaluate against costs and targets	» Management: Delivery Cost Ratio » M&E cost, and ratio (% of total)	» To deliver good Efficiency and Effectiveness you need to monitor results and costs on an on-going basis, with information feeding back into management decision making » It is important that the VfM approach is built into the way donors commissions and carries out ex-post evaluations, which are often the only way of assessing actual outcomes and therefore cost: effectiveness of infrastructure related interventions with long gestation periods
	Efficiency: » Assess extent to which project met cost efficiency targets, and were those realistic	» Delivery of planned outputs, e.g. » Number of advisory outputs delivered e.g. sector strategies, capacity building programs » Increase in infrastructure capacity and distribution coverage » Number of households connected	
	Effectiveness: » Assessing the entire project's viability, effectiveness, and value	» Results from delivered outputs, e.g. » Response to changes in policy » Improvement in performance of regulatory agencies » Increase in PPI investments » Increase in infrastructure capacity, productivity and quality of service » Access (household connected and cost/household)	

Annex 2. Unit Costs and Benchmarking

1. Framework for Establishing and Benchmarking Unit Costs

1.1. Introduction

The term “unit cost” is used in different ways and for different purposes at various stages of a VfM evaluation. In essence:

Unit cost = production cost of an asset or service per base unit

Where: the base unit can be an input, output, outcome or impact (as relevant to the case and to the project stage);
And: the production cost will be an estimate during identification and preparation stages, becomes confirmed after implementation, and can be evaluated for impact only once the life-cycle implications of both costs and benefits can be determined in the future.

The term “*unit cost*” is useful because it provides a convenient normalisation against a measure that is of particular interest or relevance. The *benchmarking* of unit costs however is only meaningful when either costs are a linear function of the base unit, or when economies of scale or scope are taken into account. Two examples illustrate the point:

Scale: the cost of power production for a large state is lower per unit of energy produced or household served than for a small state. The main factor here is the *scale*. The *efficiency* of the production only becomes apparent in the unit cost when like is compared with like, such as the unit cost of production for small states, or production for large states.

Scope: the cost of road construction per kilometre is lower for a rural or farm-market road than for a highway or limited access expressway. This is due to a difference in scope, which in this case is the functional standard of the asset and relates to factors such as traffic, travel speed, safety and terrain, which can raise the cost per unit length by a factor up to 100. If the base unit is changed from an output-type to an outcome-type measure such as vehicle travel the comparison is inverted, with the unit cost per vehicle-kilometre/year of a rural road being many times greater than for a highway or expressway.

These factors of scale and scope should be taken into account when selecting the base unit and evaluating unit costs at any VfM stage.

1.2. Build-up of Costs During Project Cycle

The evolution of the cost estimate during the project life cycle, discussed in Section 3, is summarised in Table A2.1 below. The use of input unit costs during design improves the reliability of the output cost estimate at preparation, but the output estimate is further modified by the quality of procurement and by the effectiveness of project management during implementation. Monitoring the variations and evaluating the causes across all stages will provide the data necessary for conducting a VfM evaluation after completion of the project.

Table A 2.1. Evolution of costs during project cycle for production of an infrastructure asset			
Identification	**Preparation**	**Implementation – Contract**	**Completion/Evaluation**
Estimate often based on output-based average unit cost, preferably adjusted for physical conditions, demand and market conditions.	Detailed estimate, applying input-based unit costs to design quantities and specifications, with systematic evaluation of influencing factors.	Relationship of contract cost to detailed estimate depends on procurement and market factors, perceived risk factors (financial, security, climate, corruption).	Relationship of completion cost to contract cost depends on effectiveness of project management and controls, robustness of design and contract, quality of employed firms, and incidence of risk events.
Output unit cost estimate	Input units, & Output unit	Updated input unit costs, Updated output unit cost	Output unit costs, outcome unit costs

The factors affecting the reliability of unit cost estimates at each level – input, output, and life-cycle – are summarised in Table A2.2 below, including guidance on how the costs should be monitored and evaluated.

Table A 2.2. Factors influencing build-up of project costs and value for an infrastructure asset		
Cost component	**Influencing factors**	**Guidance**
Input costs (factors affecting Economy)	Design quantities, input prices and productivity – influenced by an array of factors such as commodity prices, border prices for imported materials, local market supply and demand, import content of materials, equipment and labour rates and availability, location (which affects transport haul costs, availability of and premium on natural materials, climate impacts on productivity, environmental mitigation and land access).	Using a risk-based approach, identify (i) the sensitive pay items or categories affecting the total cost; and (ii) the items where quantities are difficult to measure or prone to being increased – for benchmarking and monitoring during implementation. Specification or cost of some items may be inappropriate for the project purpose. In opaque or weakly controlled environments, some quantities or unit prices may be inflated or misrepresented at design stage to allow for gain during implementation.
Output costs (factors affecting Efficiency)	Procurement method and process (including award), effective competition, market conditions, Industry capacity, technology and operation (in relation to the selected firm(s) and to industry-wide initiatives). Management, supervision and control of costs, quality and productivity during implementation. Transparency and accountability of project owner and implementation process.	Monitor project cost variance across phases (preliminary-design-contract-finish) longitudinally by project and across projects by owner (a pattern of high variances between certain phases indicates areas of weak controls or capacity). Generate normalised average output cost of facility based on completed cost, relevant base unit (e.g., floor area, line length, road space, pumping stations, etc.) and category of facility (e.g., building type, pipeline or transmission line type, road class, etc. with sub-categories as needed) – to allow monitoring of average output unit costs.
Life-cycle costs (factors affecting Effectiveness)	Initial development and inception costs, operating and maintenance costs, periodic rehabilitation and upgrading or replacement costs: Affected by: initial design standard (capacity, life, durability, quality) and construction quality at completion; operational performance; forecast demand.	Expressed as annualised spending cost, or subsidy; or as a user tariff (cost per unit service) – as appropriate. This is the ultimate unit cost affecting VfM, as it combines tradeoffs between present and future costs, economy and efficiency.

Input costs: The input costs are computed from the quantities and prices of design components and the productivity of the construction process. This determines the Economy component of VfM, where choices of design standard and specifications will determine how well the infrastructure service or programme is 'fit for purpose'. Scale and scope are important factors influencing the cost estimate – fixed costs and other factors raising the unit cost of small scale projects and economies of scale reducing the 'unit' cost of large projects, and high quality specifications or high performance materials

likewise raising the cost. The choice of cost estimation methodology may be a factor – simplified norm-based methods of cost estimation may result in higher cost variance later in the project cycle but market-based methods should reduce the later variance. Finally, the risk of price manipulation should be assessed – either deflation to influence project approval or inflation to permit rent-seeking. Evaluation of the reasonableness of the cost estimate should focus first on the large cost components or items, second on items where benchmark values are available elsewhere in the industry or local economy, and third on items where quantities or quality may be difficult to verify.

Output costs: The output cost reflects the efficiency of project delivery relative to the estimate base on input costs. It is influenced by the procurement process, the quality and capacity of the firms awarded the contract, the quality of project management and the transparency and accountability of the overall implementation process. In an efficient process the variations to the price arising at these successive stages should be low but, if not, they can result in substantial changes to the completion cost and thus to the original expectations of budget, economic feasibility or value for money. The strategy for managing the VfM impacts has two key elements:

(i) **Monitoring input and output costs throughout the project cycle:** Monitoring the variation in project cost across successive stages of the project cycle – from preliminary estimate to design, design to contract award, contract to completion (Table A2.2) – and benchmarking this against comparators that may point to underlying inefficiencies or distortion. For example, a pattern of high variance between design and contract price with one project owner, or firm, or aid programme may indicate weak competition, weak procurement processes or collusion; similarly, a pattern of high variances between contract price and completion cost may indicate weak project management, rent-seeking, or poor design.

(ii) **Establish a base unit:** Normalising the project cost using a base unit which allows comparison of the output cost with other infrastructure assets and projects. As noted in the table, the base unit (which may be area, length, sub-asset, etc.) should reflect the primary measure that is appropriate to the type or category of assets. Differences in scope can be addressed by defining sub-categories to reduce the range of normalised cost variance – for example, in electric power sub-categories of ‘grid-based’ and ‘off grid’ production.

Life-cycle costs: As infrastructure assets have a long functional life a key VfM consideration of effectiveness is the tradeoff between the initial development cost and the future cost stream required to operate, maintain and rehabilitate the asset over its functional lifetime. Expressed as an annualised cost, this is the ultimate measure of cost-effectiveness of the asset – an estimate of the annual spending required to build and operate the facility at the desired level of service. It is also a useful gauge of the level of tariff that might be applied to the infrastructure services. If a high initial cost and standard yields a long functional life and a low annualised total cost, then this is a measure of good effectiveness. In VfM analysis, this can be used to compare and evaluate the performance across the whole network of an infrastructure service – such as power supply, water supply, road provision and management – and over time. It is also useful for comparing the services between public, private or public-private provision of the services, and for benchmarking across countries.

Outcome costs: In the final stage, the costs may be linked to various outcome measures relating to the infrastructure service and to various impacts – such as job creation, improved health, and carbon emissions – as shown by the cost-effectiveness indicators in Table A2.3 below.

Table A 2.3. Cost Effectiveness Indicators	
Investment	**Objectives**
Roads	Cost per km of road construction Cost per km of road maintenance Cost per green job created Cost per household accessed Cost per business accessed Cost per supplementary infrastructure (e.g. bridge, footpath)
Power (Grid Based)	Cost per tonne of carbon averted (any figure below the cost of carbon, around £14) is deemed as cost effective Cost per DALY (health benefits due to air quality improvements) Cost per green job created Cost MW of installed capacity Cost per beneficiary accessed Unit costs of operation and generation (per kwh) Fuel efficiency Kwh per gallon of diesel/oil/unit of gas consumption Frequency of power outages (% availability of plant) Reductions in productivity losses by businesses Cost per incremental household accessing energy (off grid only)
Water	Cost per DALY averted Cost per green job created Cost per incremental household accessing energy
Irrigation	Cost per ha of irrigation construction Cost per m3 of water supplied Cost per DALY averted Cost per job created Cost per unit of land productivity increase (kg/ha) Cost per productivity increase of irrigated land (kg/m3)
ICT	Cost per computer room Cost of setting up internet connection Cost of establishing mobile access per household Cost per ICT training per person Cost per 1% increase in election participation

1.3. Monitoring Costs to Build Knowledge Base

The most reliable approach to benchmarking infrastructure costs and to determining indicative unit costs is to establish systems for monitoring and recording project costs within a logical framework of an infrastructure programme at country or regional level. This builds up knowledge bases on average and unit costs that are relevant to the local region, country and sector.

Resources which include similar knowledge bases built for specific purposes include, e.g. the Africa Infrastructure Country Diagnostics (AICD) study for the Africa region and the Road Cost Knowledge System (ROCKS) for roads in developing countries supported by the World Bank. The Construction Sector Transparency Initiative (CoST) has launched a process for regular disclosure of infrastructure construction costs and information which when implemented would help countries and agencies build such a knowledge base.

2. Outcome Metrics

The table below provides examples of the methodologies for valuing the outcomes and benefits of the interventions in the main infrastructure sectors. It also shows how these indicators can be quantified and monetized. Outcome evaluations are designed to assess the longer-term benefits achieved by the completed project or program, although in the long run results of many infrastructure interventions (policy advice or investment projects) may still not be fully evident.

Table A 2.4. Indicators for Outcomes and Valuation Techniques			
Sector	**Type of Investment**	**Quantifiable benefits/VfM indicators**	**Means of Monetising the Indicators**
Transport	Roads – direct benefits	Value of Time (VOT) time savings in vehicle travel	Standardised methodology, based on data on travel cost and travel time before and after road valuation – based from experiences in other countries. Also willingness to pay methodologies.
		VOC – vehicle operating cost savings (often used to justify roads in situations with low traffic volume forecasts)	Standardised methodology, based on data on travel cost and travel time before and after road valuation – based from experiences in other countries. Usually require significant volumes of traffic (more than 150 vehicles per day VPD) to break even on VOC alone.
		Economic opportunities such as access to market, greater trade flows	Model using assumptions about VPD increases, leading to greater volumes of trade, valued at retail prices
		Substantial days of employment[23] for local beneficiaries	Volume of jobs created x average wage.
	Roads – indirect benefits (other necessary conditions in place, low attribution rate)	Proxied estimates on the incremental increase of school attendance for catchment population	
		Proxied increase in health access for catchment population (particularly for females)	Estimates of DALYs averted, and valued at GDP per capita
Power and energy	Grid based energy production	Carbon savings	Established methodology, using emissions factor, social cost of carbon proxy
		Reduced household energy bills	Valued by the difference in the two energy sources (kerosene, charcoal often in the counterfactual scenario) and assumptions on periodic energy consumption
		Private sector Private sector returns – additional value add and local multiplier effects	Estimated rate of return achieved through cash flow analysis and using the cost of capital. The returns are
		Net direct green job creation	Using external information on number of jobs per MW installed capacity of a type of energy technology.
	Off grid energy production and access	Greater energy access for poor households giving rise to greater welfare and wellbeing, as modelled by a consumer surplus (distributional benefit)	Estimates of incremental increase in energy consumption, valued by retail price – £ per MWh.
		Increased economic and leisure time, freed up from previously wood collection	Hours per year saved – valued by working and non-working time. Former value by wages, latter valued through revealed preference analysis[24] or stated preference. This type of information can be gleaned from focus groups or surveys
		More efficient forms of energy for the rural poor (quality) and urban poor	
		Less pressure on local forestry	Use of established Environmental valuation techniques, which value ecosystems service benefits.

[23] According to WB NSP economic appraisal, jobs were created in irrigation, transport, power, water supply and sanitation projects.

[24] A method by which it is possible to discern the best possible option on the basis of consumer behaviour. Essentially, this means that the preferences of consumers can be revealed by their purchasing habits.

Water	Water and sanitation service delivery	Opportunity cost of time spent collecting water	Local wage rates, to value time savings, time spent based on empirical evidence (Whittington et al)
		Consumer surplus gains to proxy for lifestyle and aesthetic benefits	Estimates for periodic increase in consumption, valued by retail tariff for water, to proxy welfare gains (in the absence of a social value of water)
		Household cost savings due to cheaper water access	Evidence of costs from private providers in the counterfactual scenario, and assumptions on periodic household water consumption
		Health benefits	Evidence on key waterborne diseases avoided, with probabilities and DALY conversion factors. Standardised methodologies.
Irrigation	Irrigation – direct and indirect benefits	Poverty reduction through increased agricultural productivity	Change in net farm incomes; reduction in poverty headcount
		Increased employment	Change in person months of employment generated
		Improved nutrition, improved calorie intake and improved health	Estimates of DALYs averted, and valued at GDP per capita
		Lower food prices for consumers, due to productivity gains and increased overall food supplies	% reduction in price of food; % of income spent on food
ICT	ICT – direct and indirect benefits	Reduction in transaction costs	Evaluating the impact of mobile phones on incomes and transport costs
		Improved access to education	% change in the number of people getting a degree; number of school years completed; change in number of women getting education
		Health improvement through integration of Health Information systems	Estimates of DALYs averted, and valued at GDP per capita
		Improved information access and increased participation in elections and decisions-making	Change in % of population registered for elections and participation
		Increased mobile access	% increase in mobile subscribers per 100 inhabitants
		ICT investment and economic growth	Magnitude and significance of coefficient for ICT investment and ICT expenditure on profit, sales and labour productivity using firm level data

The table above provides examples of the possible useful indicators to consider. Cost Benefit Analysis and outcome evaluation is discussed in more detail in the Economist guidance note for Economic appraisals, given below for each of the major infrastructure sectors. Below are several case studies of outcome evaluation in the roads and water sectors that illustrate Cost Benefit Analysis and effectiveness indicators.

3. Productivity Indicators

In order to assess the success of a particular project it is essential to evaluate how productive the end-product is. For example, if the project was to improve road connectivity then we need to assess its productivity by measuring among other things how many people use the road by km of track per year or volume transported. It is also essential to evaluate the potential costs of maintenance and labour requirements. The table below lists typical productivity indicators for different sectors.

Table A 2.5.

	Power (Electricity)	Road Transport	Rail Transport	Water and Sanitation	Irrigation
Capacity	Installed capacity Reserve capacity – at maximum demand (MW, and as % of total installed capacity)	Road length (km) Network density (km/100km2) Network density (km/1000 people)	Track length (km) Network density (km/100km2) Network density (km/1000 people)	Installed capacity Water storage capacity (m3/capita)	Water delivery capacity = Canal capacity to deliver water at system head/ peak consumptive demand Irrigated area (% of irrigation potential)
Output	Electricity generated			Water produced	Annual irrigation water supply per unit irrigated area (m3/ha) Irrigated area (ha)
Utilization	% capacity used	Vehicle travel (vehicle-km/yr) Freight (tonne-km/yr) Passenger travel (psg-km/yr)	Traffic density (000 of Train Units per km) Freight (tonne-km/freight train)	% capacity used Water connections (residential and non-residential, number) Domestic water consumption (litter/capita/day)	Drainage ratio (extent to which water within the drainage basin is consumed)
Coverage	Number of connections % households covered	Road length (km) Road Space (lane-km)	Road length (km) Revenue collected (total, per freight/ total tons/ km/ passengers)	Number of connections % households covered	Territory covered (ha)
Revenue	Electricity sold, total and per connection Revenue per unit (US cents/kWh)	Revenue total, per toll, per vehicle	Revenue total, per tonne, per passenger	Water sold, total and per connection	Revenue (total/ per ha)
Production	Electricity lost in distribution		Train accidents (per million train km)	Number of pipe brakes per ‘000 connections	
Labour Costs	Average cost per employee	Average cost of maintenance per employee	Average cost per employee	Average cost per employee	Average cost per employee
Maintenance	Maintenance cost per year	Average preservation cost ($/lane-km)	Man hours per thousand locomotive-kilometres and wagon-kilometres	Maintenance cost per year	Maintenance cost per ha/per year

Productivity		Volume transported by km of network (Gross (net) ton-km/km of network) Number of passenger by km of track (Gross number of passengers-km/ km of network)	Productivity of traffic: Net ton-km + passenger-km/km of network Productivity of lines: Passenger train-km + freight train-km/km of network Average haul (revenue tonne-kilometre divided by revenue tonnes) Carriage productivity: 1000 passenger-km per carriage		Agricultural productivity for irrigated areas (kg/m3) Output per unit water consumed Land productivity (crop yield – kg/ha) Total irrigated area managed per person (ha/person) Output per unit water supply (US$/m3)
Labour Productivity	Connections per employee (number)	Employment-Output Ratio – Total agency staff/Annual Vehicle travel Net ton-km + passenger-km/employee	Employees/km of network in use 1000 traffic units per employee	Water supplied per employee	Ha irrigated per employee
Service Quality	Down time Delay in obtaining connection (days) Outages, number, annually (number/year) Outages, value lost, annually (% of sales) Security of service (no. of minutes lost) Reliability of service (no. of interruptions)	User Safety: Fatality/Accident/Injury risk exposure (fatalities/injury/accident/ 100k. Vehicles-km) Mobility quality: Total vehicle delay (vehicles-hrs); Incidence of congested flow (incidence %VKT) Average travel speed (km/h) Classified road network in good/fair/poor condition (% of classified network)	Average train speed (km/h) (urban, local, intercity, etc.) % of arrivals less than 15 min. Late Train accidents (per million train km) Environment: Kj of energy per converted ton-km	Hours with water/ day Continuity of water service (hours/day) Water samples passing chlorine test (% of total)	Deliver performance ratio (quantifies the uniformity and equity of water delivery) Dependability of interval between water applications (illustrates the equity of service to water users)
Revenue Collection	Revenue collected (total, per connection and % of sold)	Revenue collected (total, per km)	Revenue collected (total, per freight, total tons, km, passengers) Price per freight/ ton/ km	Revenue collected (total, per connection and % of sold)	Fee collection ratio Average revenue per unit irrigation water delivery (US cents/m3)
Cost Recovery	Revenue as % of O & M costs Net margin (net earnings/revenue %) Cost recovery ratio, historical operating (ratio of tariff to operational cost, %)	Revenue/ Expenditure Revenue/Maintenance expenditure	Revenue as % of Expenses % of Costs covered from internal cash generation Real return on total gross assets (%)	Revenue as % of Expenses Revenue from irrigation service fee/ total O&M expenditure Cost recovery ratio (effective tariff/historical cost, %)	Revenue as % of Expenses

Annex 3. Example Logframe Metrics

Table A 3.1. Example Logframe Metrics

Type of Development Assistance	Inputs		Process		Output		Outcome		Impact	
	Financial, human and material resources used in intervention		Activities used to deliver outputs		The products, assets or services resulting from intervention		Short or medium term effects of the outputs		Longer term effects of the outputs	
	Metric	**Indicator**	**Metric**	**Indicator**	**Metric**	**Indicator**	**Metric**	**Indicator**	**Metric**	**Indicator**
Enabling Environment Reform	Availability and costs of inputs Level and composition of project costs Cost of delivery Availability of Funding Sourcing of expert advisory services Stakeholder participation (where appropriate)	Total costs (annual and aggregate) Cost breakdown Unit costs of planned inputs Amount of funding provided Consultative process costs	Progress in completing processes (procurement, delivery, monitoring) Knowledge products Consultative process	Achievement of process milestones for on-going activities, e.g. Drafting of Strategy documents Consultative process in place	Delivery of planned outputs Reports and recommendations Communications plan to support outputs	Number and rating of outputs Reports prepared, policies or regulatory changes recommended, plans/strategies prepared (cf. PPIAF Annual Report) Communications plan completed and approved	Results from delivered outputs: Policies and responses Institutional performance of regulatory agency Investor confidence in regulatory regime. Stakeholder support for strategy	Policies/ strategies adopted Level of public and private investment ABT Regulation index ratings Endorsement and participation key policies, initiatives	Increased investment in sector Wealth creation Increased access to services Improved quality of life	Level and quality of investment # jobs created Number and % of population with access to service Increase in service delivered Doing Business Rating

Institution, Capacity and Consensus Building	Availability and costs of inputs Level and composition of project costs Funding and sourcing of expert services Cost of delivery Definition of stakeholder groups[25]	Total costs (annual and aggregate) Cost breakdown Unit costs of planned inputs Amount of funding provided Consultative process costs	Progress in completing process (procurement, delivery, monitoring) Capacity building Consensus building	Achievement of process milestones for on-going activities, e.g. Institution Dev Plans TNAs, T Plans, events delivered, # trained Course evaluations completed Consultative process operating to plan	Delivery of planned outputs Delivery of institutions and capacity building activities Communications plans	Number and rating of outputs Institution Dev Plans TNAs, T Plans, training events delivered, # trained Course evaluation ratings Communications plan completed and approved Polling of stakeholders	Results from delivered outputs: Functioning institutions and processes Upgraded skills Stakeholder support for project/program	Institution Index Ratings # trained to specified level Performance ratings of staff ABT Endorsement and participation in project/ program activities	As above	As above
Project Preparation & Development	Availability and costs of inputs Level and composition of project costs Cost of delivery Availability of Funding Sourcing of expert advisory services	Total costs (annual and aggregate) Cost breakdown Unit costs of planned inputs Amount of funding provided	Progress in completing project preparation process (procurement, delivery, monitoring)	Achievement of process milestones. Progress thru' deal cycle (identification, appraisal, structuring)	Delivery of planned outputs Deals approved by sponsors/ funders	Number and rating of outputs #/value of deals approved ABT Costs/deal approved	Results from delivered outputs: Project facilities completed and operational Increased private investment Access to service	Success ratio % (deals implemented/ processed) Increase in infrastructure capacity ABT[26] Number and % of target population with access to service ABT	As above	As above

[25] On consensus building see PPIAF, *Emerging Lessons in Consensus Building for Public-Private Infrastructure*, July 2002.

[26] E.g. roads built, electricity generated, water produced.

Project Financing and Construction	Availability and costs of inputs Volume of core funding Cost of funding Co-financing Cost of delivery	Cost of delivery of planned inputs. Mobilization of core funding Opportunity cost of capital Cost of co-financing Aggregate and unit management costs	Progress in completing project financing process (procurement, delivery, monitoring)	Achievement of process milestones. Progress through deal flow pipeline (identification appraisal, structuring, funds mobilization, closure)	Delivery of planned outputs Closed projects Fund mobilisation	Number and rating of outputs Projects approved Planned facilities completed and operational Leverage Ratio (TPC/Facility financing) cf. SIAP	Results from delivered outputs: Level of investment in sector Infrastructure capacity Access to service Service delivery	Success ratio (deals implemented/ approved) Increase in infrastructure capacity ABT Number and % of target population with access to service ABT Increase in services delivered ABT	As above	As above
Operator Performance Improvement (OPI)	Availability and costs of inputs Level and composition of project costs (set-up, delivery, M & E) Cost of delivery Availability of Funding Sourcing of expert advisory services	Cost of delivery of planned inputs. Total costs (annual and aggregate) Cost breakdown Unit costs of planned inputs Amount of funding provided	Progress in completing PI process (procurement, delivery, monitoring)	Achievement of process milestones. Progress in preparing and delivering PI programmes (e.g. diagnostic, planning, delivery)	Delivery of planned outputs Improved procedures Quality Control Procedures Capacity building	Number and rating of outputs Procedures implemented and proven QC established Training delivered and rated	Results from delivered outputs: e.g. Improved operational output and efficiency Labour productivity Service quality Collections	Performance of operators against relevant financial, capacity, productivity and/or service benchmarks[27] ABT Financial impact of PI (CBA of IP components)	As above	As above

[27] E.g. cost recovery, connections/worker, collections ratio aka Cash recovery index (NIAF), frequency of interruptions.

Annex 4. Assessing VfM of Public-Private Partnerships

Many governments turn to the private sector to design, build, finance, and/or operate new and existing infrastructure facilities in order to improve the delivery of services and the management of facilities hitherto provided by the public sector. Governments are attracted by the benefits of mobilizing private capital: the estimated demand for investment in public services shows that government and even donor resources cannot fill the investment gap alone, and so harnessing private capital can help to speed up the delivery of public infrastructure.

1. What are PPPs

The term public-private partnership (PPP) can be used to describe a wide variety of contractual arrangements involving the public and private sectors where the two parties share rights and responsibilities during the duration of the contract, including franchises, operating concessions, management contracts, leases, affermages, BOTs, etc.[28] Different forms of PPPs involve various ways of allocating risks and rewards between the public and private sector parties. The range of risks include design risk, construction risk, operating cost risk, revenue risk, financial risk, force majeure, performance (of contract) risk and environmental risks.[29]

Successfully completing PPP transactions requires careful design, preparation, appraisal, procurement, contracting, and vigilant oversight if they are to bring net benefits to society, and to meet the frequent challenges of political opposition to them. For this reason, countries enact special laws to provide a framework for these arrangements and set up special PPP units to provide expertise and support to the staff of line departments that are embarking on these projects.[30]

2. Lessons Learned

The track record of PPPs in developing countries has been mixed.[31] The World Bank summarized the important lessons that have emerged out of the WBG's 20 year-long engagement in PPPs, including:[32]

- PPP programs take time to develop and bear fruit.
- Strong political commitment to attract private finance is required at the highest level, and should be sustained over time.
- Institutional and regulatory frameworks must be adequate to manage the PPP arrangements.
- PPPs should be anchored in a full-fledged national investment program
- Strategies for PPP design should demonstrate a thorough understanding of PPP benefits and risks for the public sector.
- Priority should be given to identifying PPP projects that fulfil minimum bankability requirements.
- Balanced and sustainable PPP deals require building and maintaining public sector capacities.
- PPP projects require "patient capital".

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28 World Bank, *Concessions for Infrastructure: A guide to their design and award, Technical Paper no. 399*, 1998.
29 See World Bank, *Concessions for Infrastructure* for definitions of these terms.
30 South Africa.
31 World Bank, *Africa's Infrastructure: A Time for Transformation*, Table 0.6 gives an overview of experience with PPPs in Africa in the major subsectors.
32 World Bank, *Transformation Through Infrastructure: Issues and Concept Note*, 2010.

- Procurement processes should allow for market change prior to financial close.
- Governments must show openness and flexibility to adjust to new circumstances.

3. Assessing VfM of PPP

The evaluation of PPPs poses complex issues both *ex-ante* in guiding decisions by governments and financing parties to approve or support a proposed transaction and *ex-post* in assessing whether a completed transaction was justified on VfM grounds.

Ex ante

The UK Treasury pioneered the use of highly quantitative approaches to assess VfM of PPP-type transactions in the 1990.[33] These approaches usually looked at the risk adjusted long-term costs of adopting the PPP option versus the costs of using traditional procurement (often referred to as the public sector comparator – or PSC), taking into account the higher costs of private capital and the associated transaction costs, but adjusting for the value of the risk transfer between the public and private sectors.

Comparing private and public alternatives to implement a given project is a sensible approach mainly for availability-based PPPs, where the flows of revenues – to be paid by the government – are known with sufficient certainty and there is a realistic alternative for a public sector project. However, the approach has proven to have limitations in practice, because such quantitative analysis is only as good as the available data and other factors, such as the choice of discount rate and the challenges of monetizing some costs and benefits. In addition, the PSC method may raises other issues in developing countries. On a conceptual level, many low income countries lack public funding for infrastructure projects, so developing and using PSCs in any meaningful way is generally not feasible. On a practical level, many governments lack the funding and skills to conduct the financial modelling required for PSCs and PPP references.

Several approaches have been proposed to address these issues.

Dr Shugart[34]

In a PPIAF funded report argues that it is better to approach the appraisal of PPP projects without requiring a PSC analysis in every case. The proposed approach puts more emphasis on examining representative types of PPI projects and using insights from theory and empirical findings – and seasoned practical judgment – to identify those types that are most conducive to the PPP approach and those that are not. For example, if the desired service outputs cannot be agreed among important stakeholders and cannot be specified in precise, objective, verifiable terms and fixed over the long term, then this would count as a strong mark against using a PPP model. In short, the more incomplete the contract is, the less advisable it is to use the PPI approach. A partial or full PSC comparison would normally be carried out only for representative types of projects. The PPI unit would then develop rules of thumb to be used for the routine level of project appraisal.

Hall[35]

He proposes a simplified analytical framework based on the economic elements of a PPP – finance, construction, and operation, – and the contract arrangements. This involves comparing (1) the costs of capital finance for the PPP proposal and for the public sector alternative; (2) the relative cost of construction; (3) the relative efficiency of operation under the two options; (4) the relative costs

[33] See HM Treasury *Value for Money Assessment Guidance.*2006, and also National Audit Office*, A Framework for Evaluating the Implementation of Private Finance Initiative Projects,* 2006.

[34] C. Shugart Quantitative Methods for the Preparation, Appraisal and Management of PPI Projects in Su-Saharan Africa August 2006.

[35] David Hall, Director, Public Services International Research Unit *PPPs in the EU: A Critical Appraisal,* November 2008.

associated with setting up and monitoring a PPP contract; (5) the uncertainties involved in such contracts.

Table A 4.1. Framework for Evaluating PPP Proposals against Public Sector Alternative

Criteria	Parameters	Hypotheses
Cost of capital	Interest + dividends	Private sector has to pay higher interest rates than government
Cost of construction		Higher cost of 'turnkey' projects, offset by saving on cost of overruns
Cost of operation	Efficiency	Empirical evidence suggests no significant difference
Transaction costs	Preparation and tendering	Costs of preparing contracts and tenders
	Monitoring	Costs of monitoring and supervising contractors
Uncertainty	Renegotiation and contingent liabilities	Future renegotiations and changes

This approach has the virtue of simplicity. But, while it may be suitable for preliminary screening of proposals, it is unlikely to offer a robust basis for contestable political decisions by host governments.

Ex-post

An *ex-post* evaluation of PPP projects financed by the EIB[36] found that the underlying physical projects evaluated in-depth were largely completed on-time, on-budget and to specification. This reflected the use of fixed-price, fixed-term turnkey construction sub-contracts. However, while this evidence may be useful for assessing the Economy parameter of the VfM methodology it is not sufficient to determining whether the choice of the PPP mechanism was justified on VfM grounds. Assuming that the same economic benefits will be realised, the question is which mechanism will provide the lower whole-life cost to the economy. The evaluation could not quantitatively answer the question with an acceptable degree of certainty because of the complexity of modelling the *ex-post* outcomes of the alternatives available *ex-ante*. Similarly, despite the EIB's large and diverse project portfolio, it was not possible to identify suitable project pairs to make a direct comparison. Under these circumstances, it was "not possible to determine ex-post if the original decision to use a PPP was more cost-effective or not".

A PPIAF-funded study evaluated the impact of private sector participation on firm performance in electricity distribution and water and sanitation services based a sample of 302 utilities with private sector participation and 928 state-owned and operated utilities in 71 developing and transition countries.[37] The study distinguished between divestitures, concessions, and lease and management contracts to assess the impact of different kinds of private partnership.

The study concluded that private participation had a strong impact on the efficiency of utility operations, and also led to a decrease in employment. It was associated with output increases in electricity, and connection increases in water and sanitation, an improvement in bill collection ratios and in the quality of service in both sectors, the latter expressed as a reduction in distributional losses in electricity and an increase in hours of daily service in water.

The study also found a link between the form of PSP and the estimated performance impact, with the strongest effects in the electricity sector realized by utilities whose assets were divested to the private party, and by utilities managed under concession contracts in the water sector.

While this study provides a useful set of parameters for assessing Efficiency of PPPs, it does not attempt to relate the gains from improved efficiency with the costs of the transactions.

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[36] EIB Operations Evaluation Department, *Evaluation of PPP projects Financed by the EIB*, March 2005.

[37] Katharina Gassner, Alexander Popov and Nataliya Pushak, *An Empirical Assessment of Private Sector Participation in Electricity and Water Distribution in Developing and Transition Countries,* June 2007.

Annex 5. Example of an Infrastructure Facility Model

1. Facility Models and VfM

Donors are now considering new models to promote VfM in the provision of large scale technical assistance in infrastructure. Using the example of the Nigeria Infrastructure Advisory Facility (NIAF), this appendix demonstrations why facilities are "attractive [models] for DFID and if [properly] managed should generally result in lower overall costs and excellent VfM."[38]

A facility is a large programme run by one service provider to manage hundreds or even thousands of small projects. Typically, the service provider selects and appoints staff and sets up a Programme Management Unit (PMU) to manage all project operations. The PMU comprises a core team headed by a full time Project Leader, supported by specialist coordinators for each sector, such as power, roads, capital projects, urban development, etc. The PMU includes an administration team which contracts and manages all individual assignments, forecasts and controls expenditure and monitors and reports upon project outcomes.

The process of selecting and managing the projects is a key to ensuring VfM in the model. In the case of NIAF, each project starts with a request from a Nigerian counterpart for support. The request is considered by the PMU based on its merit and connection to the Logframe. For appropriate requests, the PMU develops a Terms of Reference (ToR) with clear Objectively Verifiable Indicators (OVIs) for its success; identifies and deploys technical staff; monitors the project's development; manages the administration; and evaluates the final deliverables against the OVIs.

The model has proved to be an economic and effective way for donors to deliver a complex and innovative infrastructure programme, aimed at improving the performance of existing infrastructure and of promoting public and private investments across several sectors. By setting up a single contracted service provider the provision of a large number of specialist interventions becomes possible. The donor is relieved of the burden of coordinating, administrating, implementing and multiple specialist inputs and can focus instead on the more strategic elements of programme management and with the host government and its agencies.

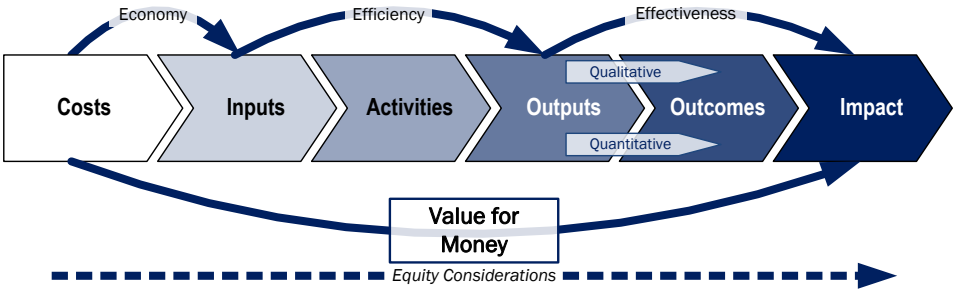
2. An Introduction to NIAF

NIAF was established in 2007 as an innovative technical assistance programme to support design, development, management and delivery of infrastructure services. The aim was to strengthen the ability of the Federal Government and State governments to provide infrastructure services, while building private sector confidence to make infrastructure investments and participate in the delivery of services.

The aim of the NIAF Programme is to enhance the capacity of the Government of Nigeria (GoN) and its agencies to plan, finance and operate federal and state infrastructure through the provision of high quality technical assistance, particularly on power supply, transport and infrastructure financing.

The initial 4-year programme commenced in November 2007 following the competitive appointment of Adam Smith International (ASI). The initial programme budget was £13.5m, but demand for services soon exceeded the available resources. At the request of the Government of Nigeria, the budget was increased on three times occasions, retendered in 2009 eventually reaching £32.6m.

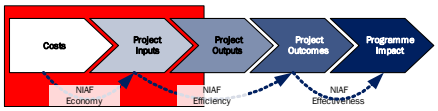
[38] NIAF1 Project Completion Report.



A second phase (NIAF2) of support, also run by ASI, will run from January 2012, with a budget of £44.4m over 5 years. NIAF2 also expanded into new sectors, including climate change and urban development. NIAF2 also measures equity in the context of the Results Chain (see above) in evaluating the effectiveness of a programme/intervention. The programme considers its impact in terms of broadly based economic growth.

3. Economy in the Model

This model promotes exceptional VfM through economy because it:



- Captures **economies of scale** in administrative costs through the size of the programmes;
- Minimizes the **administrative burden** for the donor;
- Enables economical **oversight** and retains donor control over strategic direction.

The PMU carries the entire administrative burden of managing and coordinating projects under NIAF, as well as logistics such as travel, security, and accommodation. The management cost is included in the contract with the donor.

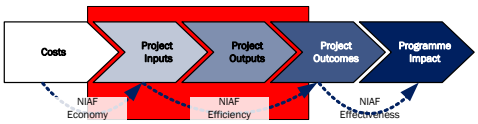
The service provider also establishes an international pool of technical experts with knowledge and experience of the full range of technical, market, project and commercial issues relevant to the aims of the Facility. In most cases, technical assistance is provided through a combination of experts embedded within government institutions, supplemented by specialists drawn from the pool as requirements determine. **The administrative burden for the donor is minimised to a single contract**, together with the involvement of country-based advisers to monitor progress, rather than managing a large number of specialists.

Using a single service provider also creates a **simplified approach for the donor to oversee** that both the business plan and logframe reflect the donor's aims. This captures economies of scale for the donor in programme management, especially M&E. It is also far easier for the donor to adjust the strategic direction of a single service provider, who then can then manage change among the sub-projects accordingly, rather than the donor having to change a wide range of projects with varied providers, timescales, logframes, and so on. Finally, as discussed in Section A, it can be difficult to measure the VfM of various infrastructure activities in isolation. By unifying the range of infrastructure activities under one umbrella, donors can gain a more accurate measure of VfM.

4. Efficiency in the Model

This model promotes exceptional VfM through efficiency because it:

- Allows the PMU to **scale up and replicate** successful interventions;
- Permits the PMU to respond **flexibly and quickly**;
- Provides a more efficient allocation of project management **costs and risks**.



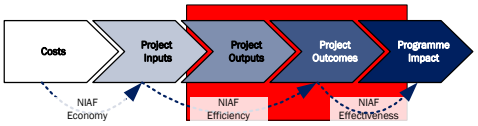
The PMU manages hundreds of relatively small (e.g. less than £60,000) interventions. The size of individual projects allows the PMU to identify successful interventions for **scaling up and/or replication** across geographies or sectors. Conversely, interventions which deliver poor VfM can be shut down quickly, without an effect on the scale of the overall programme. Since the projects are small and are developed and managed by the PMU (rather than being tendered), the model efficiently permits the PMU the **flexibility to respond quickly** to requests for support.

The PMU is designed to operate with the **like a private sector consultancy**: the PMU is responsible for preparing an inception report, work plan and budget for the duration of the programme, based on the contract terms of reference. Project management, including planning, deployment, and M&E is shifted to a private sector service provider, representing a **more efficient allocation of administrative costs and risks**. The project delivery systems and processes supplied by the service provider are critical to the success of the programme, since the service provider is responsible for coordinating and deploying all technical assistance inputs.

5. Effectiveness in the Model

This model promotes exceptional VfM through efficiency because it:

- Only supports project which have **local ownership** and support;
- Ensures consistent, **high quality outputs** linked the overall strategic goal;
- **Improves incentives** for service providers to promote VfM.



NIAF is a **demand-driven** facility: technical assistance requests are solicited from Federal and State Government and their agencies and reviewed in consultation with DFID. Individual requests for technical assistance are considered based both on their individual merits and links to the programme logframe. This ensures every project has local ownership and support, which is critical to the effectiveness of the interventions. It also creates grass roots level support through the highest levels of the GoN; which in turn supports between overall cooperation between Nigerian and British Governments focused on support to critical reform areas.

Further, because all the individual projects are selected, managed, and evaluated under a singular, effective framework, the projects are of a **consistent quality** and aligned to the logframe. The level of that quality and strength of the link to the logframe depends on the quality of the service provider. In the case of NIAF, a rigorous project-based M&E system is in place to evaluate each intervention against its OVIs, while a facility level M&E system ensuring rigorous and robust quality assurance throughout the life of the programme.

An innovation in NIAF2 is the use of **an output-based payment scheme,** which incentives the service provider to promote effectiveness through high quality deliverables. The output based

payment scheme links a percentage of overall payment for the management of NIAF2 to the achievement of logframe targets.

6. Results: Evidence of Effectiveness, Economy, Efficiency

"NIAF's assistance has been key in helping the Presidential Task Force on Power drive forward the power reform programme." His Excellency, Goodluck Jonathan, The President of Nigeria

"The programme is rightly regarded as one of DFID Nigeria's success stories and a model for how innovative, effective and successful development projects should be designed, managed and implemented." Richard Montgomery, DFID Nigeria Head of Office

"NIAF's professional but practical approach to delivering expert support has proved to be extremely effective. We believe that DFID's NIAF project is rightly regarded as one donor assistance programme that has truly succeeded in delivering a direct impact on our country's economic reform effort, " Arch. Nuhu Wya Minister of Power

NIAF has delivered significant technical assistance to the Nigeria government to prioritize, plan, and manage infrastructure projects. NIAF's project management is successfully transforming the energy and transportation sectors and attracting infrastructure financing. Independent reviews have confirmed it has achieved a high level of credibility with the Government of Nigeria. The flexibility of the inputs and the quality of expertise provided are greatly valued by all the various agencies receiving support. Crucially the owners and drivers of the reform strategy are the Government of Nigeria, not external donor, lenders or foreign experts. The NIAF programme is providing essential support and specialist guidance to help them carry it out.

NIAF's results have directly addressed the concerns of ordinary Nigerians, targeting projects which improve daily life. For example, an independent survey of power users in Nigeria has confirmed that over 90% of Nigerian polled reported an improvement in their power supply. This translates as improvement in power supply to over 130 million Nigerians.

On the overall question of value for money for the NIAF programme, account should be taken of the large capital investments needed in Nigeria to provide adequate basic infrastructure. This is especially the case for electricity supply and (road and rail) transport, amounting to many billions US$ equivalent. The Ministry of Power estimates the annual loss to the national economy of inadequate power supplies at more than $10 billion. The top 20 priority roads projects have a capital cost of about $30 billion. Considering the scale of those figures, the cost of the NIAF programme will be good value if it stimulates private investments and ensures planned government expenditure is applied effectively.

Administration costs, which include PMU technical support and coordination work, amount to about 10% of the overall programme cost. This is good value, considering the complexity of the programme.

Independent annual and completion reviews confirm the model works well, with specialist consultants succeeding in building reputations for their professionalism and in forging effective working relationships at all levels in government and their agencies. The programme is flexible such that support can be mobilised quickly; equally, activities may be quickly changed or closed if found to be ineffective or inappropriate. NIAF was also awarded the British Expertise award for Overseas Development Project of the Year in 2010-11 and Highly Commended in 2011-12 by the Association of Project Managers (APM).

The overall measured development impact of NIAF1 supported programmes includes:

- £34 of additional investment for every £1 invested by DFID in the NIAF project.
- An annual saving of £65m/yr from NIAF's work on Urban Transport reform.

- Because of NIAF assistance the Federal PPP Unit will be able to attract an estimated $5bn of additional private sector investment in the infrastructure sector; the Lagos State PPP Unit will be able to attract an estimated additional $3bn over the next 5 years.
- NIAF support for power delivery has helped achieve a record power delivery with supply doubling from mid-2009 to the peak in April 2011.
- An increase in power generation from low of 45 GWh/day at the start of NIAF to an average of over 75 GWh/day has resulted from NIAF support for maintenance and rehabilitation.
- Conservative estimates of the cost saving to the city of Lagos in time not wasted suggests NIAF support to the Lagos Area Mass Transit Authority (LAMATA) alone is already saving an average of $104 million annually. NIAF support benefits 700,000 passengers, whose journeys are reduced by an average of 25 minutes.

NIAF's engagement in the power sector is its largest programme of activity. The scale, complexity and deep-seated nature of the problems to be addressed in Nigeria's failing power sector represented a formidable challenge. Nonetheless, NIAF has made steady progress in addressing key obstacles to the reform of the sector, including establishing the Presidential Taskforce on Power (PTFP) and develop detailed plans for the recovery and development of the power sector.

A notable change in the Federal and State Governments' capacities are their ability to work with and attract financing from the private sector. NIAF's team of PPP consultants have for the past three and a half years been working with Federal and State Governments to design, establish and manage the creation of ground-breaking PPP units. NIAF helped establish Nigeria's first ever Federal PPP unit, the Infrastructure Concession Regulatory Commission (ICRC) – With NIAF support the Federal PPP unit was recognised by Africa Investor Magazine as the PPP Champion of the Year 2011.

Annex 6. Sources

Sectors

Water and Sanitation

Africon, *Unit Costs of Infrastructure Projects in Sub-Saharan Africa*, Background paper 11 (Phase I) by AICD, Africa Infrastructure Country Diagnostic, World Bank, June 2008

Gassner, K., A. Popov and N. Pushak, *An Empirical Assessment of Private Participation in Electricity and Water Distribution in Developing and Transition Countries*, 2007

IEG (World Bank Group), *Water and Development, an Evaluation of World Bank Support 1997-2007*, 2010

IEG (World Bank Group), *Water Management in Agriculture: Ten Years of World Bank Assistance 1994-2004*, 2006

Popov Alexander, J. Katharina Gassner, and Nataliya Pushak, *An Empirical Assessment of Private Sector Participation in Electricity and Water Distribution in Developing and Transition Countries,* June 2007

World Bank, *Africa's Water and Sanitation Infrastructure: Access, Affordability and Alternatives*, 2011

Banerjee, S. V. Foster, Y. Ying, H. Skilling, Q. Wodon, *Cost Recovery, Equity and Efficiency in Water Tariffs: Evidence from African Utilities*, AICD Working Paper 7, May 2008

Power and Energy

Africon, *Unit Costs of Infrastructure Projects in Sub-Saharan Africa*, Background paper 11 (Phase I) by AICD, Africa Infrastructure Country Diagnostic, World Bank, June 2008

Eberhard, A., O. Rosnes, M. Shkaratan and H. Vennemo, *Africa's Power Infrastructure: Investment, Integration, Efficiency*, World Bank, 2011

Gassner, K., A. Popov and N. Pushak, *An Empirical Assessment of Private Participation in Electricity and Water Distribution in Developing and Transition Countries*, 2007

Popov Alexander, J. Katharina Gassner, and Nataliya Pushak, *An Empirical Assessment of Private Sector Participation in Electricity and Water Distribution in Developing and Transition Countries,* June 2007

Transport

Africon, *Unit Costs of Infrastructure Projects in Sub-Saharan Africa*, Background paper 11 (Phase I) by AICD, Africa Infrastructure Country Diagnostic, World Bank, June 2008

Humplick, Frannie and William D.O. Paterson (1994), *Framework of Performance Indicators for Managing Road Infrastructure and Pavements,* The World Bank, 3rd International Conference on Managing Pavements

Rail Productivity Information Paper, March 2008, by John Hearsch Consulting Pty Ltd; Commissioned by the National Transport Commission

Ken Gwilliam, Vivien Foster, Rodrigo Archondo-Callao, Cecilia Briceño-Garmendia, Alberto Nogales, and Kavita Sethi (2008), *The Burden of Maintenance: Roads in Sub-Saharan Africa*, AICD Background Paper 14

World Bank, *Transport for Development: Safe, Clean and Affordable: The World Bank Group's Transport Business Strategy 2008-2012*, 2008

New Zealand Ministry of Transport, *Transport Monitoring Indicator Framework*, 2009

Teravaninthorn, S. and G. Raballand, *Transport Prices and Costs in Africa: A review of the Main International Corridors*, AICD Working Paper 14, July 2008

World Bank, *Africa's Transport Infrastructure: Mainstreaming Maintenance and Management*, K. Gwilliam et al, 2011

Irrigation

A. Inocencio, M. Kikuchi, D. Merrey, M. Tonosaki, A. Mauyama, I. De Jong, H. Sally, and F. Penning de Vries. *Lessons from Irrigation Investment Experiences: Cost-reducing and Performance-enhancing Options for sub-Saharan Africa*. Final Report by International Water Management Institute, August 2005

Banerjee, S, and E. Morella, *Africa's Water and Sanitation Infrastructure: Access, Affordability and Alternatives*, World Bank, 2011

Beshir Abdu and Sileshi Bekele, *Analysis of irrigation systems using comparative performance indicators: A case study of two large scale irrigation systems in the upper Awash basin; Oromia Water Works Design and Supervision Enterprise*

M.G. Bos, M.A. Burton and D.J. Molden (2005), Irrigation and Drainage Performance Assessment: Practical Guidelines

World Bank, *Africa Region: Irrigation Business Plan*, October 2007

ICT

Andrew Paterson, 'Costs of information and communication technology in developing country school systems: The experience of Botswana, Namibia and Seychelles', Human Sciences Research Council, South Africa *International Journal of Education and Development using Information and Communication Technology (IJEDICT),* 2007, Vol. 3, Issue 4, pp. 89-101.

Christoph Stork, *Sustainable Development and ICT Indicators*, International Institute for Sustainable Development, September 2007

Cost-Benefit Analysis

IEG (World Bank Group), *Cost-Benefit Analysis in World Bank Projects*, Fast Track Brief, June 2010

Transport: DFID economist guide http://www.transportlinks.org/Economist%20Guide/English/Intro.htm

Water and sanitation: WELL resources Centre guidance; ADB handbook on economic analysis for water supply projects – CBA analysis http://www.lboro.ac.uk/well/resources/Publications/guidance-manual/guidance-manual.htm

Unit Costs

Africon, *Unit Costs of Infrastructure Projects in Sub-Saharan Africa*, Background paper 11 (Phase I) by AICD, Africa Infrastructure Country Diagnostic, World Bank, June 2008

A. Inocencio, M. Kikuchi, D. Merrey, M. Tonosaki, A. Mauyama, I. De Jong, H. Sally, and F. Penning de Vries. *Lessons from Irrigation Investment Experiences: Cost-reducing and Performance-enhancing Options for sub-Saharan Africa*. Final Report by International Water Management Institute, August 2005

African Development Bank Group, Sector Study Section

African Development Bank Group, Database of Projects

Productivity

African Development Bank Group, Sector Study Section

Rail Productivity Information Paper, by John Hearsch Consulting Pty Ltd; Commissioned by the National Transport Commission, March 2008

Humplick, Frannie and William D.O. Paterson, *Framework of Performance Indicators for Managing Road Infrastructure and Pavements,* The World Bank, 3rd International Conference on Managing Pavements, 1994

M.G. Bos, M.A. Burton and D.J. Molden, Irrigation and Drainage Performance Assessment: Practical Guidelines, 2005

Beshir Abdu and Sileshi Bekele, *Analysis of irrigation systems using comparative performance indicators: A case study of two large scale irrigation systems in the upper Awash basin; Oromia Water Works Design and Supervision Enterprise*

Ken Gwilliam, Vivien Foster, Rodrigo Archondo-Callao, Cecilia Briceño-Garmendia, Alberto Nogales, and Kavita Sethi, The Burden of Maintenance: Roads in Sub-Saharan Africa, AICD Background Paper 14, 2008

General

Banerjee, S., A. Diallo, V. Foster and Q. Wodon, *Trends in Household Coverage of Modern Infrastructure Services in Africa*, World Bank Policy Research Working Paper 4880, March 2009

Castalia, *Evaluation of the Demonstration Effect of IFC's Involvement in Infrastructure in Africa,* February 2011

DFID, *How to Note: Guidance of Using the Revised Logical Framework*, January 2011

DFID, *Infrastructure and pro-poor growth, Pro-Poor Growth Briefing Note 4*, April 2006

DFID, *Managing and Reporting DFID Results* (website)

DFID, *Spot-Check of Economic Appraisals and Logframes,* Evidence presented to Parliamentary Select Committee, October 2011

DFID, *Working Effectively in Conflict-affected and Fragile Situations: Briefing Paper 1: Monitoring & Evaluation*, March 2010

Foster, V., *Overhauling the Engine of Growth: Infrastructure in Africa*, AICD, September 2008

HM Treasury, *Valuing Infrastructure Spend: supplementary guidance to the Green Book*, November 2011

http://www.ppiaf.org/ppiaf/page/results/monitoring-evalation/methodology

House of Commons International Development Committee, *DFID's Role in Building Infrastructure in Developing Countries*, September 2011

IEG (World Bank Group), *Assessing IFC's Poverty Focus and Results*, 2011

IEG (World Bank Group), *Safeguards and Sustainability Policies in a Changing World*, 2010

International Development Committee, *DFID's Role in Building Infrastructure in Developing Countries,* November 2011

Khandar, S., G. Koolwal and H. Samad, *Handbook on Impact Evaluation: Quantitative Methods and Practices,* World Bank, 2010

OECD, *Aid Effectiveness 2005-2010: Progress in Implementing the Paris Declaration*, 2011

OECD, *Guidance for Managing Joint Evaluations*, 2006

OECD, *Quality Standards for Development Evaluation*, 2010

OECD. Promoting Pro-Poor Growth: Infrastructure, 2006

PIDG, *Results Monitoring Handbook*, August 2010

PPIAF, *Annual Report, 2011*

TI-UP Note: *Infrastructure Economic Appraisal*, September 2011

World Bank Projects Database

World Bank, *Africa's Infrastructure: A Time for Transformation*, 2010

World Bank, FEU, *Describing and Exploring Private Participation in Infrastructure Services (PPIS) Database*, June 2009

World Bank, *Infrastructure: Lessons from the Last Two Decades of World Bank Engagement*, January 2006

World Bank, *Ten Steps to a Results-Based Monitoring and Evaluation System*, Jody Kusek and Ray Rist, 2004

World Bank, *Transformation through Infrastructure: Issues and Concept Note*, 2010

World Bank, *World Bank Group Sustainable Infrastructure Action Plan*, FY 2009-2011, July 2008Yepes, T, J. *Pierce and V. Foster, Making Sense of Africa's Infrastructure Endowment: A Benchmarking Approach*, AICD Working Paper 1, January 2008

Adam Smith
INTERNATIONAL

Westminster Tower
3 Albert Embankment
London SE1 7SP