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Innovative Performance Based Procurement Procedures for Construction Contracts

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Common Innovative Contracting/Procurement Procedures

#1 Performance-Based Lump-Sum Contracting (PBLSC)

(Useful for implementation of Fixed Amount Reimbursable Agreement (FARA) and Host Country Contracting (HCC))

#2 Geo-Hazards & Construction Risk Management and Risk Sharing

#3 A (cost) + B (time or other incentives) Bidding

#4 Pay Equation & Value Engineering

#5 Lane, Shoulder, Airside Rental

#6 Construction and Maintenance Warranties

#7 Urgent/Emergency Job Order Contracting

Use of the Innovative Contracting/Procurement Procedures

- Donors use innovative contracting/ procurement procedures to support effective implementation of member countries Host Country Contracting (HCC) contracts

- 95% of Donors contracting procedures of infrastructure and facilities are HCC

USAID Proposed Procurement Reform

- Two key purposes:
  - Increase effectiveness of USAID's foreign assistance efforts in accordance with Paris Declaration on Aid Effectiveness
  - Enhance competition and broaden partner base when using direct contracts or grants through commercial firms and nonprofit organizations

- Objective #1: Strengthen host government capacity to improve aid effectiveness and sustainability
  - Increased use of robust host country systems (HCS) that meet certain minimum standards
  - Enhance Agency governance programs through renewed focus on strengthening public financial management and procurement systems

Host Country System (HCS) implementation procedures
Advantages

1. **Accelerate technical and institutional capacity building of local governments and engineers**

2. **Produce significantly more benefits** *(more km of road accessibility to motorized and non motorized users of farm to market roads)*

3. Promote competitiveness among local contractors and allow implementing fixed cost contracts and FARA agreements
4. Give opportunity to COs, COTRs, DLIs and others to innovate and support accelerated graduation of the grant beneficiaries to own and maintain infrastructure
5. Accelerate culture change towards graduation and avert institutional “vacuum/ shock” when international consultants depart the country
6. Two independent layers of QC/QA of IFI and country

Host Country System (HCS) implementation procedures
Disadvantages

1. **Might be 'too innovative" to missions that "feel" that they have limited engineering capabilities**

2. **Possible corruption practices** *(has been a consideration/ justification to using USAID direct contractual mechanism, including the program management/ "USAID Design/ Build mechanism")*

3. **Possible additional implementation delays related to use of 2 independent layers of QC/QA**. *(Example: Controllers in Peru, Jamaica, Brazil would stop project implementation when cost overrun over 25%)*

Innovative Contracting Procedures
Benefits

Traditionally	Infrastructure projects are design, bid, and built with contract **awarded to lowest $ bidder**
Innovative Contracting	Allows for **additional factors** to be considered **in combination with the lowest $ bid** for a given quality of service (such as less time, better quality, less claims and other services provided) *Host Country Contracts (support Objective #1 of USAID's proposed procurement reform) or USAID Direct Contracts*

#1 Performance-Based Lump-Sum Contracting

Support cost reliability and cost effectiveness by:

- Provides incentives and encourages collaboration of all stakeholders and especially, contractors and supervisors
- Shifts reduced civil works cost overrun risk to contractor, who has greater ability to manage that risk
- Promotes culture of stakeholder partnership between agencies, users, and affected communities - supports a higher standards of ethics

Been used by:

- U.S FHWA, FIDIC, Donors, U.S & U.K Civil Engineering Associations, European Development Fund, US COE, Federal Highway Administration, U.S state and local DOTs, among others.

Cost-plus Contracting

- Cost-plus contracts may play an important role in cost overruns and implementation delays when:
  - Contractors and supervisors do not have incentives to support cost reliability or cost effectiveness.
  - Risk sharing procedures are not clearly defined.
  - Proper code of ethics is not enforced.

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#1 Performance-Based Lump-Sum Contracting

Examples of PBLSC:

- **Ecuador Coastal Road Rehabilitation (2004)**
  - Reduced monopoly of large contractors
  - Reduced road construction and maintenance costs (reconstruct, rehabilitate and maintain 1300 km vs. estimated output of 1000km)
- **Guyana Road and Bridge Investments (2004)**
  - Ongoing road and bridge investment and maintenance projects used value-engineering to avert cost overruns
  - Previous cost-plus contracts had suffered cost overruns of 30-63% on construction contracts and much more on supervision contracts
- **IADB Case Study**
  - 67.5 km Puerto Cayo-San José-San Lorenzo-San Mateo road project financed by CAF under cost-plus contract: unit cost of over $500,000/km
  - Using PBLSC on projects financed by IDB in same location: reconstruction/rehabilitation costs reduced to $40,000/km

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#2 Geo-Hazards and Construction Risk Management

Management Issues:

- Seismic forces, heavy rainfalls, inadequate surface and sub-surface drainage facilities increase frequency and severity of infrastructure damages
  - *Slope erosion (gullying), mud and debris flows, rock/scree falls, landslides, flooding*

- **Flooding is most significant source of infrastructure damages**
  - *caused approx. 72% of damages in Peru 1995 – 2003*

- Comprehensive designs, monitoring procedures, and timely supervision significantly reduce Geo-Hazards damages, but not always available
  - *E.g. Ecuador-Cuenca-Molleturo; Peru-Aguatia-Puente Chino*

- Technology and proper QC/QA procedures significantly reduce Geo-hazards damages, but often not used

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#2 Geo-Hazards and Construction Risk Procedures

PBLS Contracting Procedures to Address Geo-Hazards:

- Define in contract when and to what extent each party is responsible for preparedness, mitigation and remediation
  - *E.g. For possible flooding damages caused by el Niño phenomenon, define responsibility of each party, including road agency, civil defense department and contractor (Ecuador, Peru)*
- In case of non-compliance of one party, contract specifies when and what other parties must do to avoid damages
- Include rewards for initiatives of collaboration
  - *E.g. Contractor receives additional compensation when they assume responsibility of civil-defense department to mitigate flooding risks outside road right of way (ROW) if flooding is imminent.*
- Provide additional compensation when contractor:
  - uses state of art technology to monitor possible Geo-hazards
  - produces cost effective preparedness works for slope stability, river training, or flood preventions

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#3 A + B Bidding

- **A (cost) + B (time or other incentives)**

- Select low bidder based on monetary combination of contract bid item and time needed to complete entire project or critical portion of project
  - Example: Using road users cost of $X/day for B factor

- Motivates contractor to minimize overall time on high priority and high usage projects. Encourages contractors to finish early by:
  - Offering bonuses for early completion
  - Assessing fines for late completion

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#3 A + B Bidding

Useful where:

- Traffic restrictions, lane closures or detours result in high user costs
- Safety concerns or significant impacts to local community during construction warrant expediting project
- Effective traffic management can maximize contractor's ability to reduce construction time
- Project is relatively free of third party conflicts (e.g. land acquisition, resettlement, utilities)
- **Public or Mission is interested in completing project as soon as possible**

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#3 A + B Bidding

Example: Baku-Ceyhan Pipeline

- British Petroleum constructs petroleum pipeline, using lump-sum contract procedures.
- Included A (construction cost) + B (time factor) equivalent cost bidding procedures, with local contractors and international contractors such as Bechtel.
- Pipeline is designed to resist earthquake activities with magnitudes of 8 to 9 on the Richter scale, considering 2 repetitions of these seismic magnitudes.

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#4 Value Engineering & Pay Equations

- Recognize that non-homogenous soils and materials characteristics are unavoidable and affect quality, performance, and construction and maintenance costs of infrastructure

- Pay Equations allow an agency to adjust contractor's payment according to actual level of quality received and time of product delivery
  - Example: FHWA uses value engineering and pay equations in its general specifications to address non-homogenous characteristics of asphalt mixtures, and to promote quality pavement performance

- Procedures of value engineering and pay equations should be defined in PBLSC to avoid project delays and cost overrun

#4 Value Engineering & Pay Equations

Example:

Pay Equation for asphalt pavement mixtures:

PF=106-1.314*(TPD+DPD)-0.2045*(RPD)^2

PF= Pay factor (%)

TPD= Thickness percent defective

DPD= Density percent defective

RPD= Roughness percent defective

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#5 Lane/Shoulder/Airside Runway Rental

- Contractor is **charged fee (not a fine/penalty) for occupying** runway, road-lanes, or shoulders to do contract work
- **Motivates contractor to minimize time** that a lane, shoulder, or a combination of both are out of service and significantly impacting users
- Charge can be either hourly rate or daily rate
- Charges per lane can vary from zero to high cost, depending on time of day, amount of traffic, and other user costs

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#5 Lane/Shoulder/Airside Runway Rental

Useful where:

- Traffic restrictions or lane closures result in high user costs
- Project is free of third party conflicts (ROW, utilities, social/environmental)
- Traffic control plan allows contractor flexibility in works scheduling to minimize impact of lane or runway closure
- Agency seeks contractor expertise to work efficiently and to minimize time that lanes out of service
- Use of alternative routes or detours is impractical
- Benefit of reduced negative impact to users is greater than additional cost to minimize time for lane closure

#6 Construction and Maintenance Warranties

Rehabilitation/reconstruction warranties:

- Issued for specific product or work item (such as asphalt pavement)
- Usually issued for a period of 2 to 5 years
- Only for items over which **contractor has full control**

Example:

- Acceptable: Warranties for preventing of pavement failure such as rutting, roughness or fatigue cracking
- Unacceptable: Warranties for preventing excessive road surface deflection (FWD, BB)

#6 Construction and Maintenance Warranties

Advantages

- Less agency or owner risks
- Reduces or eliminates agency costs for quality control personnel by making contractor responsible
- Creates incentives to contractors and consultants to improve overall project quality

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#7 Urgent/Emergency Job Order Contracting

- Combining of many contracts or many urgent works into one, administrated by one project team.
- Projects are competitively bid, indefinite quantity, indefinite delivery and fixed unit prices.
- Competitive selection procedures and using fixed unit prices may reduce total project cost during emergencies.
- Contractors have incentives to produce good quality products in order to receive more quantity of works.
- Opportunity for participation of small businesses that cannot compete for larger projects (Ecuador, Bahamas)

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#7 Urgent/Emergency Job Order Contracting

- May cover all types of works, construction, repair, maintenance and rehabilitation of different facilities (roads, bridges, seawalls, docks, water supply etc.) under a single contract with fixed unit costs

- Contracts are in place before completion of final/detailed designs of emergency works

- Quality indicators are more flexible

  - Example: Roads have shorter expected life expectancy (ELE), higher roughness (IRI) and rutting values
  - In Ecuador, after el Niño, pavement ELE was 3-5 years, and IRI was 2.5-3.9 m/km).
  - Haiti-Ennery Bridge/Ford was design for 3-year ELE

Innovative Performance Based Procurement Procedures
Ten Ideal Contract Characteristics

1. Contracts include comprehensive and detailed designs aimed at achieving cost effective, cost reliable (within 5-10% of actual costs), affordable and achievable results

2. Supervisory firm with adequate experience of administrating lump-sum contracts

3. Sufficient time is available for the contractor to review, revise and accept design and construction responsibilities

    - *Example: In Guyana, selected contractor compensated in full and successor bidders receive up to 65% of design review cost item of selected contractor.*

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Ten Ideal Contract Characteristics

4. Mandatory participation of all stakeholders in pre-contract signature conference to discuss specific lump-sum characteristics of project

5. Before parties sign contract, selected contractor certifies that there are no known errors or omissions in contract documents

6. Risk sharing procedures are defined in contract

8. Specific bonus and penalty clauses, for both quality and schedule, are defined in contract

9. Value Engineering Incentives and Pay Equations that reward innovation, transparency and stakeholders collaboration are defined in contract

10. Additional maintenance warranties are included

Thank You
Any Questions?

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