

Basic Concepts in Alternative Procurement, Operations and Financing for Public Infrastructure

Learning Module
Content Framework Outline

May 21, 2018

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Definitions, Functional Categories and a Combination Approach to 'P3s'

<i>Key Definitions</i>	
Project	Infrastructure asset or system capex
Agency	Decision-making authority responsible for public water infrastructure
Traditional Approach	Generally used by US Agencies for Project procurement, operations and financing
Non-Traditional Approach	Generally used by private-sector and some utilities for assets similar to Project
Alternative Approach	When Agency modifies and adopts a Non-Traditional approach for a Project
Public-Private Partnership or P3	A synergistic combination of Non-Traditional approaches adopted by an Agency as an Alternative

A Clear Framework Requires Clear Definitions

- One of sector's biggest issues is lack of clear language
- More precise definitions of existing terms
- New terms for necessary new concepts: 'Non-Traditional' is well-established approach outside the public sector but it only becomes a practical 'Alternative' after an approval process

<i>Project Functional Category</i>
Design & Construction
Operations & Maintenance
Debt Financing
Equity Ownership

Framework Anchored in Context of Project Functional Aspects

- Any value from Alternative comes from some functional aspect of a project – descriptions should be anchored in function
- For this purpose, all major capex projects considered to have four functional categories
- Color coded throughout

<i>Typical Functional Category Combinations</i>	
	Design & Construction + Operations & Maintenance
	Design & Construction + Operations & Maintenance + Debt Financing
	Design & Construction + Operations & Maintenance + Debt Financing + Equity Ownership

'P3s' Described in Context of Functional Combinations

- 'Public-Private Partnerships', 'Public-Public Partnerships', 'P3s', etc. can be described as transactions that utilize Alternative approaches in two or more functional aspects
- Color coded in yellow and with color reference to components

Summary of Framework Concepts

1. Traditional approaches generally used by US water-sector Agencies for infrastructure procurement, operations and financing evolved over a period of steady economic and demographic growth. Traditional approaches were effective in those conditions.
2. Private-sector companies, some utilities and non-US agencies developed different, Non-Traditional approaches for similar assets in response to different conditions (e.g. competition, regulated returns or more limited resources)
3. Since about 2000, many water-sector Agencies face a much more challenging 'new normal' economic and demographic outlook.
4. Many water-sector Agencies also face huge deferred maintenance and delayed investment liabilities.
5. To meet these challenges, many Agencies will need increased efficiency in procurement and operations of physical assets, flexibility in financing and (in some cases) significant risk transfer.
6. Well-established individual Non-Traditional approaches clearly have potential to provide increased efficiency, financial flexibility and risk mitigation, primarily due to the similarity of assets and institutional frameworks required for infrastructure operation.
7. Combinations of individual Non-Traditional approaches – generally called 'P3s' – can provide further value through synergies and transactional economies of scale.
8. But Non-Traditional approaches are rarely immediately utilizable by Agencies – a process of adaptation, approval and acceptance is required before they become real 'Alternatives' for public water infrastructure.
9. The process of adaptation, approval and acceptance will occur naturally over time in response to 'new normal' conditions, and Alternatives will become the 'new Traditional'. But due to the high accruing and compounding cost of deferred maintenance and delayed investment, this process must be accelerated.
10. Many Agencies face significant limiting factors that are unrelated to potential value in accelerating the adoption of Alternative approaches.
11. Non-Traditional approaches involving infrastructure equity sharing or transfer, and especially P3 combinations involving these, create additional limiting factors for Agencies.
12. Conclusions drawn from this framework provide specific implications for WIRF Learning Module design and content

1 Evolution of Traditional Approaches

Traditional approaches of US public-sector Agencies to water infrastructure procurement and operations evolved over a period of steady economic and demographic growth. They were effective in those conditions.

- Traditional approaches are a ‘legacy’ of benign period (roughly 1950-2000) – *not* a reflection of intrinsic public-sector limitations
- Traditional approaches often prioritized an Agency’s direct and sole responsibility for infrastructure as a simple and effective way to fulfill obligations to the community.

<i>Functional Category</i>	<i>Traditional Approach</i>	<i>Why Traditional Approach Worked 1950-2000</i>
Design & Construction	Design-Bid-Build	<ul style="list-style-type: none"> • Multiple low-bid steps created a simple and transparent process • Technological complexity and environmental standards were lower • Long-term cost-effectiveness less important in a growth environment where assets needed replacement or expansion before end of useful life
Operations & Maintenance	In-house capability	<ul style="list-style-type: none"> • In-house capability ensured direct control and responsibility to community • Steady or growing revenues meant steady or growing O&M budget • Simpler technology and lower environmental standards meant less need for outsourcing scale economies or expertise • Disciplined whole-life approach less important in growth environment where assets needed replacement or expansion before end of useful life
Debt Financing	Tax-exempt municipal bonds	<ul style="list-style-type: none"> • Relative inflexibility of bond debt was less important in stable conditions • Subsidized, dedicated muni market offered unbeatable interest rates and demand • Fewer binding fiscal constraints (e.g. statutory debt limits)
Equity Ownership	Sole municipal ownership	<ul style="list-style-type: none"> • Less need (and little community interest in) ownership risk transfer or sharing • Even smaller systems were considered viable in a growth environment • Local control more important during community development phase

2 Evolution of Non-Traditional Approaches

Private-sector companies, and some utilities and non-US agencies developed different, Non-Traditional approaches for similar assets in response to competition, regulated returns or more limited resources.

- During 1950-2000 period, private-sector companies, some utilities (mainly energy) and certain non-US public sector agencies (mainly in UK, Canada, Australia) developed approaches for similar physical infrastructure assets under different, often less benign, conditions.
- The approaches are in fact well-established – they are called ‘Non-Traditional’ here only in the sense that they are not Traditional for US Agencies.

<i>Functional Category</i>	<i>Non-Traditional Approach</i>	<i>Purpose of Non-Traditional Approach</i>
Design & Construction	Design-Build and variations	<ul style="list-style-type: none"> • Cost efficiency and certainty of delivery date are central factors in competitive, non-monopoly environment • Specific performance more important than specific control • Latest technology needed to be included • Asset economics analyzed in entire useful life time frame
Operations & Maintenance	Long-term outsourcing	<ul style="list-style-type: none"> • Private-sector focus on core-competency; outsourcing non-core is standard • Cost efficiency through scale economies; specific control less important • Performance-based contracting is natural part of profit-maximization
Debt Financing	Private placement, Project finance	<ul style="list-style-type: none"> • Even for highly-rated companies with access to bond market, major physical assets often financed with private placements (bank, insurance debt) for flexibility, renegotiation • Project finance SPV framework for off-balance sheet accounting, contract attachment
Equity Ownership	Joint-ownership or partnership arrangements	<ul style="list-style-type: none"> • Natural co-alignment of profit-maximization among otherwise different partners means cost-effective sharing of risk, expertise • Higher cost-of-capital than public sector, equity is scarce resource

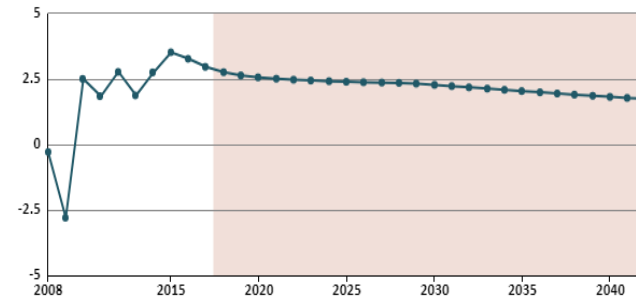
3 The 'New Normal': Challenging Economic and Demographic Outlook

Since about 2000, the public sector in general and many water-sector Agencies face a much more challenging economic and demographic outlook, often called the 'new normal' to reflect expected permanence

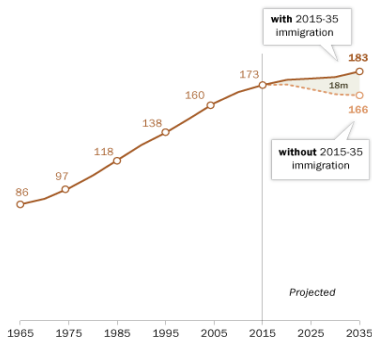
US Economic Outlook

- 2008 financial crisis punctuated persistent systemic trend
- Slow and uncertain recovery from 2008 FC, consensus forecast for lower long-term growth
- Increased volatility and uncertainty in public-sector revenues
- Regional growth and income distribution becoming more uneven

OECD Long-term Forecast



Working-age population (25-64), in millions

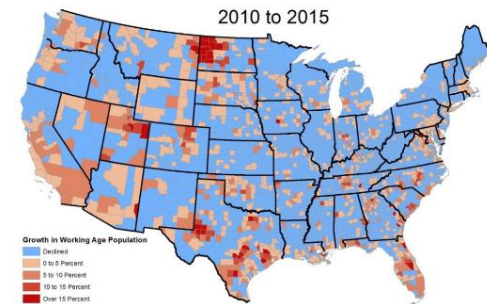


Note: Numbers for 2015 onward are projections.
 Source: Pew Research Center estimates for 1965-2015 based on adjusted census data; Pew Research Center projections for 2015-2035.

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US Demographic Outlook

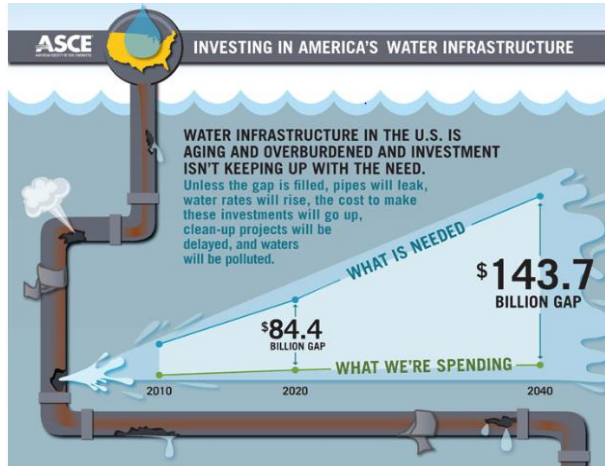
- Significant slow-down in forecast working age population growth (L)
- Outright declines in working-age population growth in many areas, especially non-urban (R)



Sources: Decennial Census Counts, Census Bureau Age Estimates

4 Maintenance and Investment Backlog: An Expensive Liability

Many water-sector Agencies also face huge deferred maintenance and delayed investment liabilities.



A Large and Growing Backlog

- A backlog in all sectors of public infrastructure, especially in drinking, waste water and storm water remediation assets, is widely recognized.
- ASCE, AWWA and NRDC recent reports have estimates close to \$1 trillion
- The backlog is especially severe for smaller systems relative to their size

Systemic Factors Behind the Backlog

- Since many infrastructure assets have useful lives of 50-75 years, current replacement volume is an echo of earlier growth periods and coincident to boomer retirement age.
- Public-sector revenue volatility since 2008 leads to balancing annual budget by 'kicking the can' – low-visibility maintenance and capex are often the target
- Public-sector GASB accounting and CAFR reports rarely measure deferred maintenance
- New and higher environmental standards can require large capex for remediation

5 Need for Increased Efficiency, Financial Flexibility and Risk Mitigation

To meet their challenges, many Agencies will need increased efficiency in procurement and operations of physical assets, flexibility in financing and (in some cases) significant risk transfer.

Cost Efficiency

- Expectation of more limited growth means resources must be deployed efficiently
- Even incremental or small percentage saving are important in scale of investment and remediation programs
- ‘Cost efficiency’ should not be viewed as ‘lowest bid for current work’ but holistically – long-term time frame, opportunity cost of further delay, opportunity cost of unadopted technology, accrual rate of deferred maintenance, lowered risk of catastrophic event

Financial Flexibility

- Higher levels of debt are inevitable – in new normal conditions, more flexible or customized terms (tenor, ability to negotiate amendments and extensions with lender, subordination, performance-based return, accounting treatment, etc.) may be more important than interest rate.
- Debt financing options should be expanded beyond muni bond market

Significant Risk Transfer

- In situations where multiple risk factors (e.g. scale, technology, resource base) cannot be adequately mitigated with performance-based contracts, joint ownership or partnerships with public or private partners should be considered.

6 Non-Traditional Approaches: Potential Value for Public Infrastructure

Well-established individual Non-Traditional approaches clearly have potential to provide increased efficiency, financial flexibility and risk mitigation, primarily due to the similarity of assets and institutional frameworks required for infrastructure operation.

- In effect, water sector Agencies in the US now face the kind of challenges in procuring, operating and financing infrastructure-type assets that the private sector and other non-US agencies are used to.
- It is unsurprising that many Non-Traditional approaches would appear to offer immediately available improvements in procurement, operations and financing.

<i>Functional Category</i>	<i>Non-Traditional Approach</i>	<i>Value of Non-Traditional Approach for Water Infrastructure in the 'New Normal' World</i>
Design & Construction	Design-Build and variations	<ul style="list-style-type: none"> • Cost-savings and faster, more certain delivery • Incorporation of new technology or innovative design approaches • DB especially applicable to large, one-off projects required by environmental standards
Operations & Maintenance	Long-term Outsourcing	<ul style="list-style-type: none"> • Cost-savings from provider scale economies and technologies • Whole-life approach to ensure asset remains efficient through an uncertain future • Insulation from revenue and budget volatility through third-party contractual requirements • Ability to downsize operations, more flexibility to manage labor
Debt Financing	Private placements, Project Finance	<ul style="list-style-type: none"> • Private placements can be amended and renegotiated – useful for uncertain future • Enhanced utilization of government loan programs (WIFIA, SRF etc.) that offer private placement debt • Project financing framework (SPV-issued debt) can mitigate fiscal constraints (statutory bond debt limits, arbitrary budget rules) and provide flexible contract attachment point
Equity Ownership	Joint-ownership or partnership arrangements	<ul style="list-style-type: none"> • Preservation of now-scarcer Agency equity • Risk mitigation for large, one-off projects with public or private partners • Expands options for non-monopoly infrastructure assets with technology or resource risk to increase Agency resiliency (e.g. desalination plants for drought resilience)

7 Non-Traditional Combinations: 'P3s' Often Add Further Value

Combinations of individual Non-Traditional approaches – generally called 'P3s' – can provide further value through synergies and transactional economies of scale.

- Although different functional approaches affect value in very different ways, there are many potential synergies in combining them in a single transaction.
- These combinations are often called 'P3s' (whether or not a true partnership is involved) but it is important to always view them in context of their functional components.

<i>New Definition</i>	
DBEFOM	Acronym for DBFOM P3s that include significant transfer or sharing of equity in infrastructure asset with either public or private-sector partner. Important to make clear distinction between non-equity P3s (service & debt contracts) and equity P3s (significant ownership transfer)

<i>Functional Combinations</i>	<i>Industry Names ('P3s')</i>	<i>Synergies and Applications of Non-Traditional Combinations</i>
Design & Construction + Operations & Maintenance	DBOM (Design-build + outsourced O&M)	<ul style="list-style-type: none"> • Integrating DB and whole-life O&M has significant synergies
Design & Construction + Operations & Maintenance + Debt Financing	DBFOM, Sale/Leaseback, Availability Payment P3 (DBOM + Debt Project finance)	<ul style="list-style-type: none"> • Significant transactional economies of scale in doing service contracts in conjunction with customized private-placement debt • Additional standard contract options (e.g. lease) • Project finance lenders with debt at risk can add additional layer of asset oversight and value preservation (e.g. through covenants) that is relatively naturally co-aligned with Agency
Design & Construction + Operations & Maintenance + Debt Financing + Equity Ownership	DBEFOM, Concession, Privatization (DBFOM + significant ownership sharing)	<ul style="list-style-type: none"> • Private partner with equity at risk will be highly incentivized to optimize asset performance – this can be contractually co-aligned with Agency objectives • Significant but highly defined risk transfer through overall service and debt contractual structure

8 The Process of Non-Traditional Approaches Becoming ‘Alternatives’

Non-Traditional approaches are rarely immediately utilizable by Agencies – a critical process of adaptation, approval and acceptance is required before they become practical ‘Alternatives’ for public water infrastructure.

- Since Non-Traditional approaches were developed in context of different objectives (e.g. shareholder profit), they require a process to ensure that broader Agency obligations to the community will be met.

<i>Non-Traditional Approach</i>	<i>Typical Requirements for Adoption & Acceptance as Practical ‘Alternative’</i>	
	<i>Legislative & Regulatory</i>	<i>Political & Public Perception</i>
Design-Build and variations	<ul style="list-style-type: none"> • Often requires modification of laws or rules that mandate design-bid-build 	<ul style="list-style-type: none"> • Relatively low impact? • Resistance from existing contractor base?
Long-term Outsourcing	<ul style="list-style-type: none"> • [Probably low-impact in most cases] • [public sector union contracts] 	<ul style="list-style-type: none"> • Public perception may be negative if outsourcing involves user interaction – otherwise, low impact • Political issue re local labor management
Debt Project Finance	<ul style="list-style-type: none"> • [restrictions on non-bond, private placement debt] 	<ul style="list-style-type: none"> • More complex or performance-based debt may be viewed negatively • Private placement disclosure is lower than bonds – transparency question
Joint-ownership or partnership arrangements	<ul style="list-style-type: none"> • Selling or sharing ownership of major public infrastructure assets likely requires change in legislative, local rule or regulatory restrictions – especially if partner is private-sector 	<ul style="list-style-type: none"> • Requires serious management of public perception of ‘selling the family silver’ especially if partner is private-sector • [referendum process in some cases] • [Lower impact if involves adjacent public systems?]
DBOM	<ul style="list-style-type: none"> • If classified as ‘P3’ may require legislative change 	<ul style="list-style-type: none"> • [relatively low impact?] • [no incremental process over DB and OM individually]
DBFOM, Sale/Leaseback, Availability Payment P3	<ul style="list-style-type: none"> • If classified as ‘P3’ may require legislative change • Lease or project finance characterization may be easier, especially if SPV is non-profit 	<ul style="list-style-type: none"> • If classified as ‘P3’ may require political and public perception management • Lease characterization may be easier
DBEFOM, Concession, Privatization	<ul style="list-style-type: none"> • Significant process likely to be required for any basic [monopoly] infrastructure asset 	<ul style="list-style-type: none"> • Requires serious management of political process and public perception of ‘selling the family silver’ especially if partner is private-sector

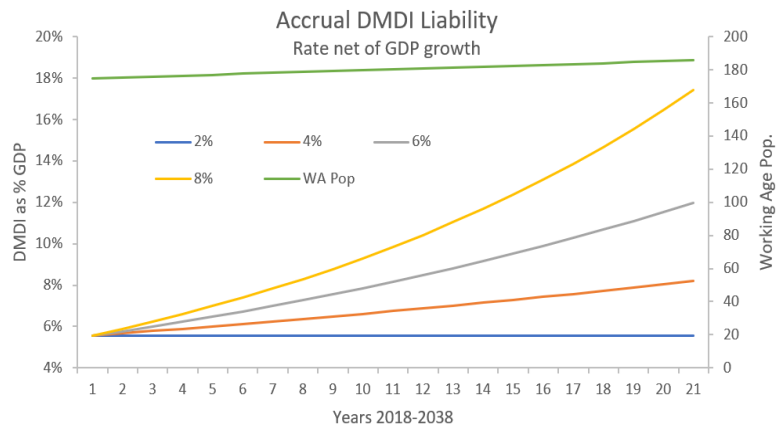
9 The Need to Accelerate the Adoption of Alternatives

The process of adaptation, approval and acceptance will occur naturally over time in response to ‘new normal’ conditions, and Alternatives will become the ‘new Traditional’. But due to the high accruing and compounding cost of deferred maintenance and delayed investment, this process must be accelerated.

Multiple Cost Factors at Work

- Current period losses may be most obvious but least damaging
- Compounding costs are often not visible and may be allowed to persist – but have worst outcomes

<i>Cost Factor</i>	<i>Nature</i>
Current amount deferred or delayed	Accretive
Inflation	Compounding
Accelerated degradation - asset	Compounding
Accelerated degradation - system	Compounding
Catastrophic failure risk	Compounding
Inefficient ‘quick fixes’	Current period loss
Quality of service degradation	Current period loss
Opportunity cost of using new tech	Current period loss



Headed to a ‘Tipping Point’?

- Balance of deferred maintenance and delayed investment likely growing faster than working-age population.
- If much faster, the liability can hit ‘tipping points’ leading into difficult-to-manage crises

10 Limiting Factors to Accelerated Alternative Adoption

Many Agencies face significant limiting factors that are unrelated to potential value in accelerating the adoption of Alternative approaches.

Examples of typical limiting factors:

1. Reluctance to admit inadequacies of Traditional approaches in 'new normal' conditions
2. Apparent complexity and unintended consequences of Alternative approaches when pre-packaged as 'P3s'
3. Accounting and institutional accommodation of 'doing nothing'
4. Abstract or long-term nature of Alternative value
5. Lack of clarity that developing acceptable Alternatives from Non-Traditional approaches is an important and value-added process in itself

11 Special Limiting Factors for Equity Transfer and DBEFOM P3s

Non-Traditional approaches involving infrastructure equity sharing or transfer, and especially P3 combinations involving these, create additional limiting factors for Agencies.

- Non-Traditional approaches which involve only service and debt contracts are fundamentally much less difficult to adapt as Alternatives than those which involve any significant amount of equity transfer or sharing. Three distinct categories might be useful:

Type of Contract or Relationship	Non-Traditional Approach	Additional Facilitating or Limiting Factors	Most Practical Applications
Service or Debt Contracts	Design-Build	<ul style="list-style-type: none"> • Public sector personnel have familiarity and expertise with service contracts • Debt private placements becoming more common in municipal finance • Project finance and lease structures (i.e. using revenue bonds) are typical in public sector • Private placement debt is from state/federal program (WIFIA, SRFs) 	<ul style="list-style-type: none"> • Most basic, monopoly infrastructure
	Long-term Outsourcing		
	Debt Project Finance		
	DBOM		
	DBFOM		
Public-Public Equity Sharing or Partnership	Equity Sharing	<ul style="list-style-type: none"> • Sharing asset with similar, adjacent public system – co-alignment of interest is natural • Public partner is federal/state policy-oriented program or philanthropic • Perception of adjacent system being more challenged 	<ul style="list-style-type: none"> • Basic, monopoly infrastructure when rationale for sharing is straightforward and compelling • Special cases where asset or technology has green or social aspect and partner is policy-oriented or philanthropic
	DBEFOM Public-Public Partnership		
Public-Private Equity Sharing or Partnership	Equity Sharing	<ul style="list-style-type: none"> • Fundamental lack of co-alignment • Perception (and often reality) of large difference in relevant contractual experience 	<ul style="list-style-type: none"> • Major non-monopoly, ‘merchant’ or resiliency assets, with technology, resource or revenue risk and where co-alignment, sophistication levels are closer
	DBEFOM Public-Private Partnership		

12 Conclusions and Implications

Conclusions	Implication for WIRFC Learning Module
<p>1. Traditional approaches to public-sector infrastructure are undergoing a necessary transition to improve efficiency, financial flexibility and risk mitigation. Well-established Non-Traditional techniques for this purpose exist outside the public sector -- but a process is required to make them practical Alternatives to Traditional approaches.</p>	<ul style="list-style-type: none"> ➤ Recognizing the importance of this process is key to accelerating Alternative use and faster transition to stable New Traditional approaches for the public sector
<p>2. The potential value of an Alternative technique is always related to its specific function in the infrastructure project. But project functional categories are fundamentally different. A different process is required to create Alternatives in each category.</p>	<ul style="list-style-type: none"> ➤ The process of Alternative creation should always be described in terms of clearly separated tracks for each functional category
<p>3. Combining Alternatives for different functional categories in the same project can provide significant additional value through synergies and scale economies. A single term, 'Public-Private Partnership' or 'P3', has evolved to refer to all such combinations, regardless of fundamental differences. This is the source of considerable confusion.</p>	<ul style="list-style-type: none"> ➤ While the P3 name will remain widespread, Alternative combinations should always be described in terms of specific functional categories. Current industry acronyms are generally effective for this, but a new one is necessary: 'DBEFOM' to refer to combinations that include significant project equity ownership change or sharing.
<p>4. The public sector has considerable expertise and experience in infrastructure service contracts (construction, operations) and debt financing. This greatly facilitates Alternative creation in these areas. In contrast, the public sector generally has little or no experience in selling or sharing ownership and equity of infrastructure, especially basic essential assets. This is a difficult area for Alternative creation.</p>	<ul style="list-style-type: none"> ➤ The vast majority of necessary improvement is related to deferred maintenance and delayed investment in basic essential assets where ownership and equity Alternatives have limited application. The primary focus in Alternative creation should be on service contract and debt Alternatives.
<p>5. There are many steps between the identification of a useful Non-Traditional technique and the execution of an Alternative approach. The full process involves an increasing number of parties. The process will benefit from establishing a solid foundation of clear concepts and value demonstration among project personnel who are closest to the technical issues and are involved throughout the process.</p>	<ul style="list-style-type: none"> ➤ WIRFC Learning Module should focus on helping project personnel establish a foundation for the Alternative process, with specific objective as first presentation to outside parties.