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MIPAD – Mega Infrastructure Planning Appraisal and Delivery Program
University College London

Effects of Policy and Institutional Design on Performance of PPPs for Mega Infrastructure Projects

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- Context
- Infrastructure Delivery Options
- Recent experience with PPPs
- Funding vs Financing
- Ingredients to change PPP paradigm.

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Context

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History

- One of the earliest applications of **project finance** dates back to **1299**, when the English Crown enlisted a leading Florentine merchant bank to aid in the development of the **Devon silver mines**. (Kensinger 1988, in Esty 2004)

- The bank received a one year lease for the total output of the mines in exchange for paying all operating costs without recourse to the Crown if the value of amount of the extracted or was less than expected (Kensinger 1988, in Esty 2004) – Today this is called a production paying loan

- Other examples are investors providing funds to the **Dutch East India Company** and the **British East India Company** for voyages to Asia, and afterwards they were paid according to their share of the cargo when it was sold

- Many other examples can be found in the colonial period

Sizing the problem

- $57 Trillions required in infrastructure, between 2013-2030, only to keep up with project GDP growth
  - Includes Transport (road, rail, ports and airports), power, water and telecommunications

- 60% more than previous 18 years ($ 36 Trillions)

- Over last 18 years advanced economies were responsible for more than 70% of global infrastructure investment.

- In the next 18 years emerging economies are estimated to represent 40 to 50% of global spending

The World Bank estimates that universal access to sanitation and improved water is more than 50 year away for African countries (Africa Infrastructure: a time for transformation, 2010)

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Motivation

- **PPP have developed in part due to financial shortages in the public sector**
  - Hidden deficits: Mismatches debt -deficits (one-off operations below the line)
  - Eurostat, IMF “re-link” (stock-flow adjustments), but discrepancies, because of accounting mechanism

Evidence

- **PPPs have demonstrated the ability to harness additional financial resources and operating efficiencies inherent to the private sector, but**
  - PPPs often ignored in public books leading to apparently sustainable debt until a crisis occurs
  - Increased awareness of PPPs' impact on fiscal sustainability attempt to offset lower public investments during crisis
  - When exclusively financed through the State budget, Operation and Maintenance frequently suffer from under-financing, because their costs occur to the whole infrastructure stock, and not only to the new launches
- **PPPs enabled risk sharing with private partners, but**
  - Practical results have often led to the State assumption of whole risk
- **Whether to involve the private sector is the wrong question.**
  - Focus should be on achieving an enhanced mixture of private & public sector participation in project (and its risks) to maximise public value

Financial Support through lifecycle

- Building a transport infrastructure is expensive but the subsequent stages also have significant costs
  - Operation and Maintenance (O&M) highly variable according to mode.
- When exclusively financed through the State budget, Operation and Maintenance frequently suffer from under-financing
  - Because their costs occur to the whole infrastructure stock, and not only to the new launches
- O&M cannot be subject to annual budgets with great fluctuations
  - Because service standards (Operation) must be stable to attract and retain clients, and Maintenance operations have high capital intensity and require heavy (thus regular) use of that capital to be efficient

Who should bear the costs ?

- The argument that infrastructures supports services of general interest (public interest) has very frequently been the basis for provision without direct cost to users
  - This means costs are borne by tax payers, through the State budget

- Typically supported by 3 groups: users (direct beneficiaries); tax payers (most frequent) ; indirect beneficiaries (less common)

- But for the past 150 years, in periods of introduction of new infrastructure types with big advantage over previous types, there has been the capacity to directly charge users in exchange for earlier provision of those advantageous infrastructure units
  - Often with recourse to private companies as concessionaires, taking the risk of investment and the revenue of access rights

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Infrastructure Delivery Options

A Classification of Infrastructure Delivery Models (I)

- The two axes are
  - ***Delivery Method*** (horizontal): from ***segmented*** (each stage with a separate contract) to ***combined*** (all stages in a single contract)
  - ***Client Finance Method*** (vertical) [Client = State]: from ***direct*** (all financing to come from State budgets) to i***ndirect*** (all financing done by other parties, repaid with user charges or with State budget contributions)

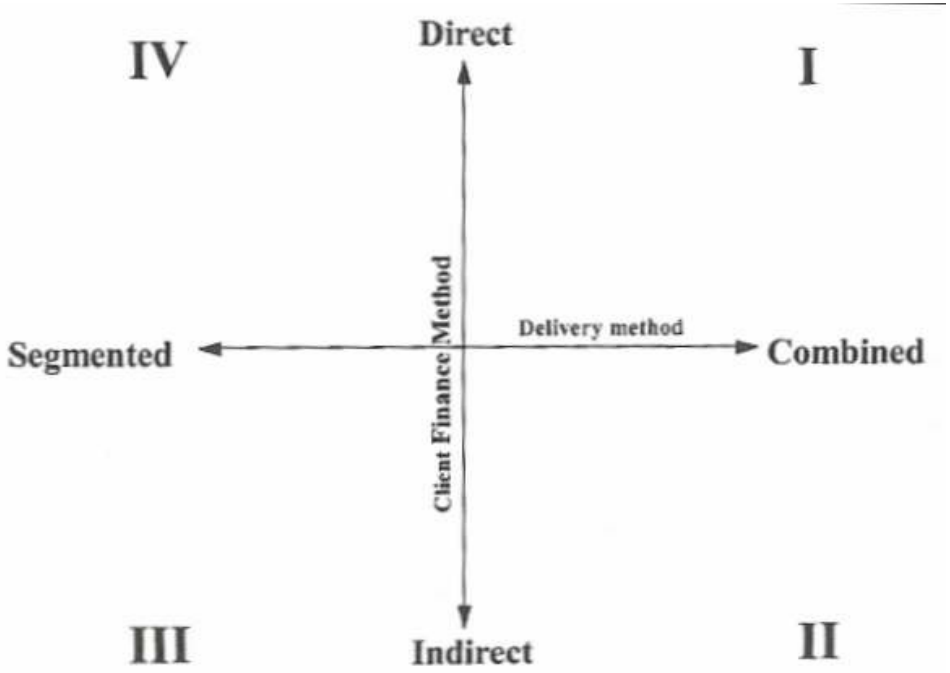

Figure 1 The Quadrant Framework

Source: (Miller, 2000).

A Classification of Infrastructure Delivery Models (II)

- Four Quadrants are defined, with multiple models in each quadrant except the (segmented, indirect) one
- The most traditional forms are in Q4, with direct financing by the State and separation of the various stages
- In Q1 the State still assures (most of) financing needs directly, but "buys" from the private sector the construction and operation of the infrastructure (possibly with maintenance in the package)
- In Q2 the Private Sector assures (most of) financing needs, keeping within its responsibility good performance of several stages of the lifecycle

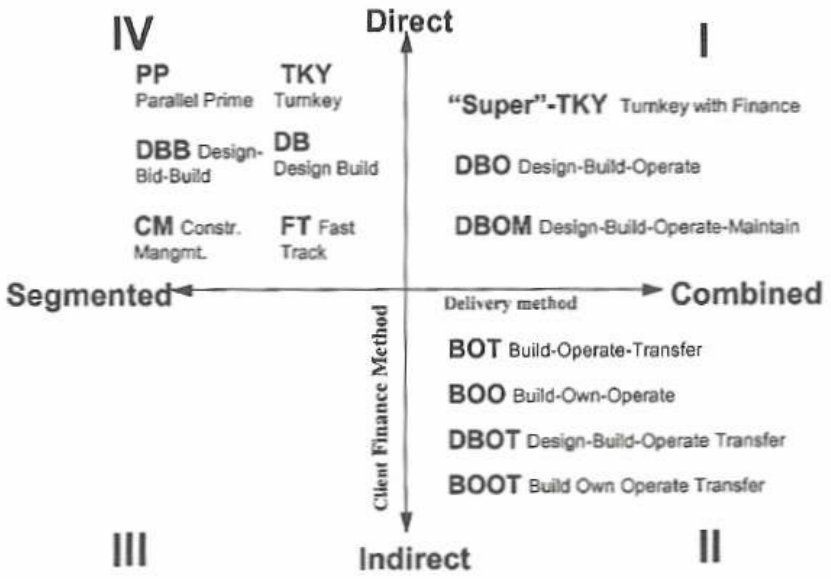

Figure 2 Fitting the Project Delivery Methods into the Four Quadrants

Value for Money (VfM), Public Sector Comparator (PSC)

- The operational tool for assessment of models in Q2 is a ***PSC – Public Sector comparator***, to compare the NPV for the public sector in a Q2 solution with the expected NPV from a solution in (Q4 + Q1)
  - Needs to define the best model in Public sector procurement (Q4 + Q1) and assess its expected performance
  - Making explicit all the risks retained by the State in both models

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Delivery Method: Technical Risk Allocation (I)

- Technical Risks across the stages in lifecycle:
  - Delays in design, coordination problems in the design team
  - Delays in design approval due to environmental assessment, public hearing or change of political preferences
    - Occasional redefinition of scope, frequent push for higher construction costs
  - Faults in design due to urgency from client
    - Frequent construction cost overruns from estimates
  - Construction delays or cost overruns due to adverse selection
  - O&M cost overruns due to moral hazard
  - Disputes about upgrade and modernization due to fuzzy specification of contracts

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Delivery Method: Technical Risk Allocation (II)

- Recourse to private companies normally justified by higher efficiency and capacity to react to contractual incentives
- There are significant cross-stage technical risks that seem to favor combined over segmented delivery models
  - But there are fewer companies capable of providing good service across a large part of the lifecycle
    - The level of competition is lower
    - The negotiating skills of these companies are much higher and there is a real risk of capture of the State in the drafting of the contract
  - And in a combined model, the risk of litigation is higher, especially in the presence of weak institutions or inefficient institutional design. Risk wrapping makes the project less accountable.

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Delivery Method: Technical Risk Allocation (III)

- The basic criterion for choice in this dimension (assuming direct financing) is the level of technical competence on the State side for the type of project at hand
  - The more the State is able to control the quality and time of delivery by the private agents in each stage, the more segmented can be the delivery model (maximizing gains from competition in each stage)
    - When the State is not competent to oversee the deliveries, it must at least ensure competence in clearly specifying what it wants (functional requirements), by which date, and with which level of adaptability to future circumstances

- There are innovative and efficient ways for a competent State authority to handle relations with providers in a segmented model

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Client Finance Method: Financial Risk Allocation (I)

- Recourse to private funding normally justified by need to reduce public debt, allowing acceleration of delivery
  - But private borrowing is more expensive than public borrowing
  - And if the return of the private investor is to be made from taxes (not user charges), this is still largely a public debt, even if formally not classified so because of the associated risk
    - Even if return based on user charges, the State could issue bonds and allocate those charges to pay them back

Client Finance Method: Financial Risk Allocation (II)

- In Q2 projects, financial / commercial risk is associated with technical risk
  - Main argument in favor is that the gains of efficient design and operation based on consideration of lifecycle costs will outweigh the additional cost of money for the private provider
  - But many facets of commercial risk are left on the State side
    - **Demand** is often related to network performance as a whole, not (only) to the infrastructure being the object of the deal, and as such a change of transport or land-use policy may be prevented by the economic impacts it would have on the concession
    - **User charges** are generally politically very sensitive, and almost always the responsibility of the State
    - But **guarantees** do not show up in the State accounts until their consequences become real

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Scope and escalating costs

- In many cases, possibly for reasons of political expediency, Governments launch projects and sign contracts with only an approximate definition of scope and framing conditions.
  - Only subsequently, often during a public hearing or discussion in a political forum, the scope will be firmly defined
  - When this happens with a provider already under contract (no competitive pressure) it is easy to get highly inflated prices, except if the fuzzyness of scope was recognized at the outset and the corresponding “soft clauses” were included in the contract

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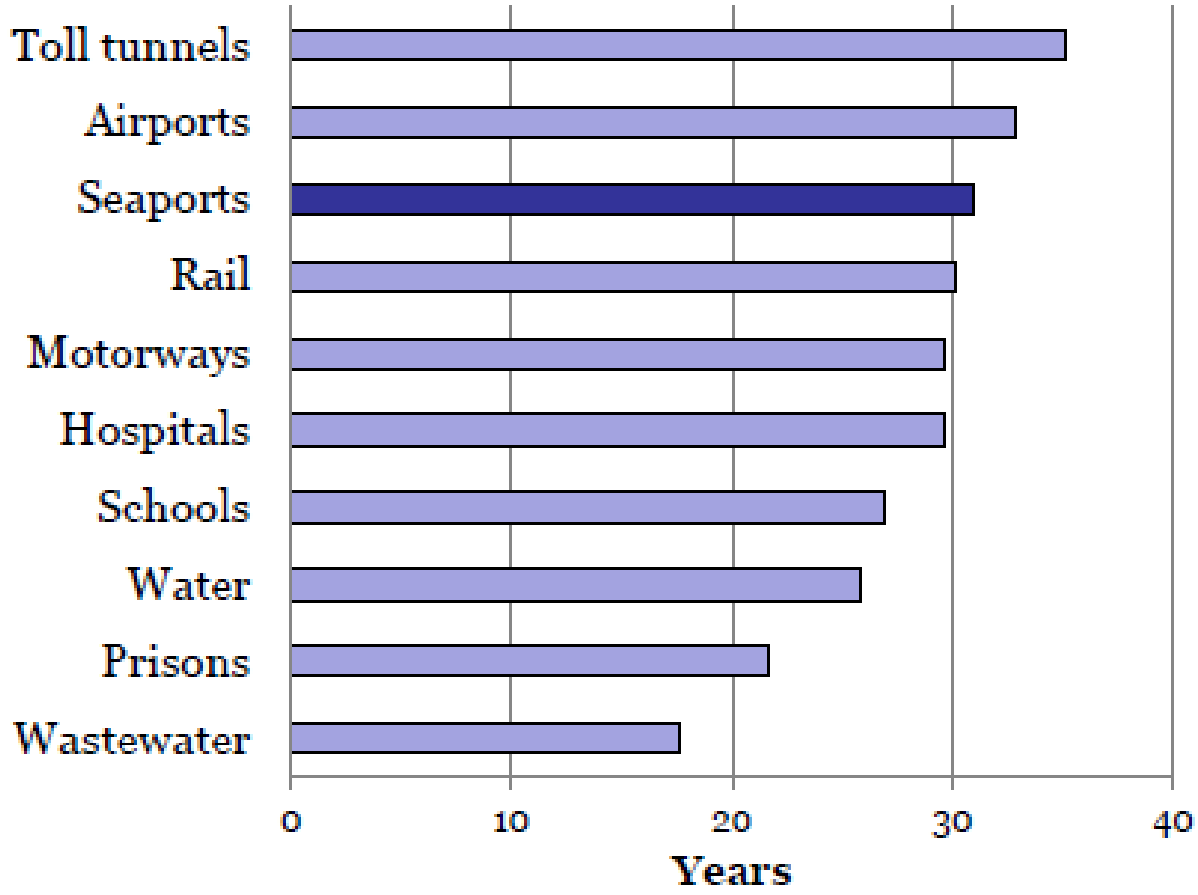
Financing the private provider during O&M stages

- In Q2 models O&M may impose high financial needs, which private providers often try to finance through bonds or in the stock market
  - To get a low price on the bonds or a good price on their shares, they must show good economic performance in the earlier periods
  - This is often achieved through under-investment in maintenance or capacity expansion [moral hazard], possibly leading to severe problems of accidents or rupture of service

Policy capture by the contract (in Q2 models)

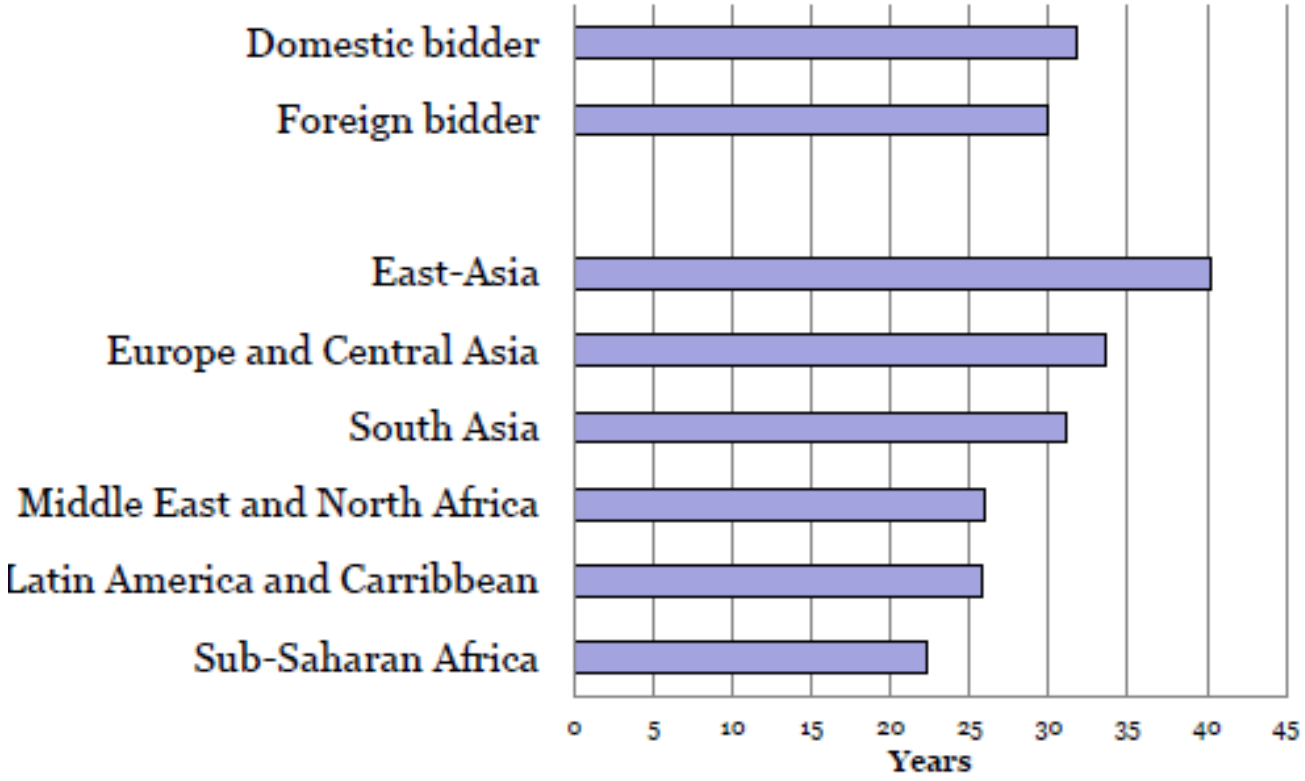
- When signing concession contracts with life spans of several decades, governments rarely even think that **there might be a change of policy** that could lead to a different preferred design or business model for the infrastructure under concession
- In most cases, governments have the authority to impose those changes but only accompanied by a **negotiation for financial rebalancing (which always occurs under conditions of information asymmetry** → expensive!)
  - Examples: a suburban motorway where a bus or HOV / HOT lane is later considered useful; a car park where the municipality later wants to increase the share of rotation places to support urban revitalization
- This risk should always be explicitly assessed. When found significant, shorter concession periods are preferable, with a new tender under possibly different conditions at the end of each period (higher transaction costs, lower risks of bail-out need)

Duration of PPP contract by sector



Source: Olav Merk (OECD), Mar 2012

Contract Duration by Geography



Source: Olav Merk (OECD), Mar 2012

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Recent experience with PPPs

Problems that have occurred with PPPs in EU (I)

- Biases in planning and forecasting hindering quality of decision at project selection stage
  - As Flyvbjerg (2009) notes "*competition between projects and authorities … creates na incentive structure that makes it rational for project promoters to emphasise benefits and de-emphasise costs and risks*"

- Biases towards developing new project instead of making a more efficient and flexible use from the existing ones, leading to maintain existing infrastructures in poor condition unable to be efficiency and instead applying funds to new infrastructures

- Weak regulation, lack of performance pressure, inadequate contractual provisions

Problems that have occurred with PPPs in EU (II)

- Insufficient skills in public administration leads to low quality decision affecting the whole value chain from ex-ante project planning and analysis down to delivery and operation

- Standard cost benefit evaluation reveals inadequate. Projects have a different costs and benefit profiles so they must be assessed against a spectrum of methods going from, financial returns, economic returns and, finally, cost benefit analysis. It is a multicriteria decision

- Biased decision making whenever projects are assessed in isolation. A systemic view is required, projects must be assessed within portfolios and programs

Problems that have occurred with PPPs in EU (III)

- Lack of robust instruments for decision making, such as national infrastructure accounts (balance sheets)
- Lack of reliable instrument for ex-ante assessement of the project costs (i.e. PSC)
- Non-efficient delivery and delays can surmount up to 30% additional costs, when studies point to possible savings of 20% from efficient delivery;

Problems that have occurred with PPPs in EU (IV)

- Lack of trust in stakeholders engagement. (e.g. petition against projects, law suites, etc)
  - Key elements to build trust are: awareness and education; transparency and accountability of decisions; active process participation leading to shared responsibility

- Lack of adequate compensation that should act as a process of recycling resources (i.e. capital or other)

Last 10 years of World Bank support to PPPs

- Observing the last 10 years of World Bank support to PPPs, in a sample of 265 mega projects we have the following distribution (IEG, 2013)
  - 171 projects had an upstream component, and
  - 94 provided downstream support, and most projects had both.
  - The most common elements were capacity building (49 projects); policy, regulatory, and institutional reforms (59 projects); and sector reform and strategy (56 project).
  - Consensus building activities and emerging best practices appear only in 7 projects.

- **This reveals how encompassing the management of PPPs can be.**

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Funding vs Financing

Two problems, not one

- **Financing**, related to debt obligation to another public or private party, with or without future revenue commitment e.g. public loans, bonds etc.

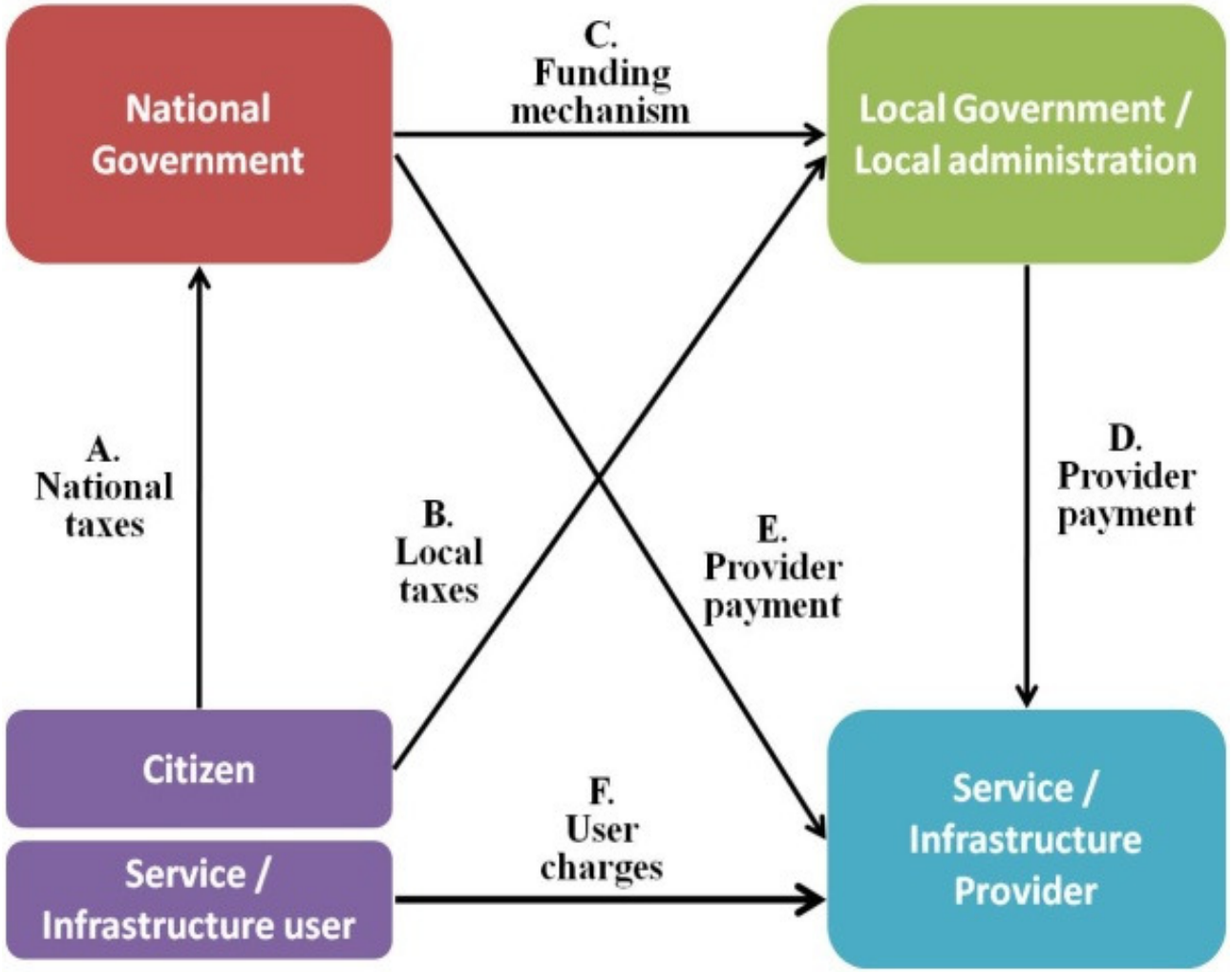
- **Funding** is related to the final bearing of the (investment or operating) costs and financing with the leverage capital to initiate the investment (and make it feasible) and or to allow running operations during a ramp-up period.

  - This means that **financing can evolve into funding** if reimbursement of those amounts is not achieved.

- **Project value** is mostly related with funding and with the results and impacts that can accrue from the project, not with the outcome itself.

- However, **political decision-making** focus on outcomes to satisfy the political cycle

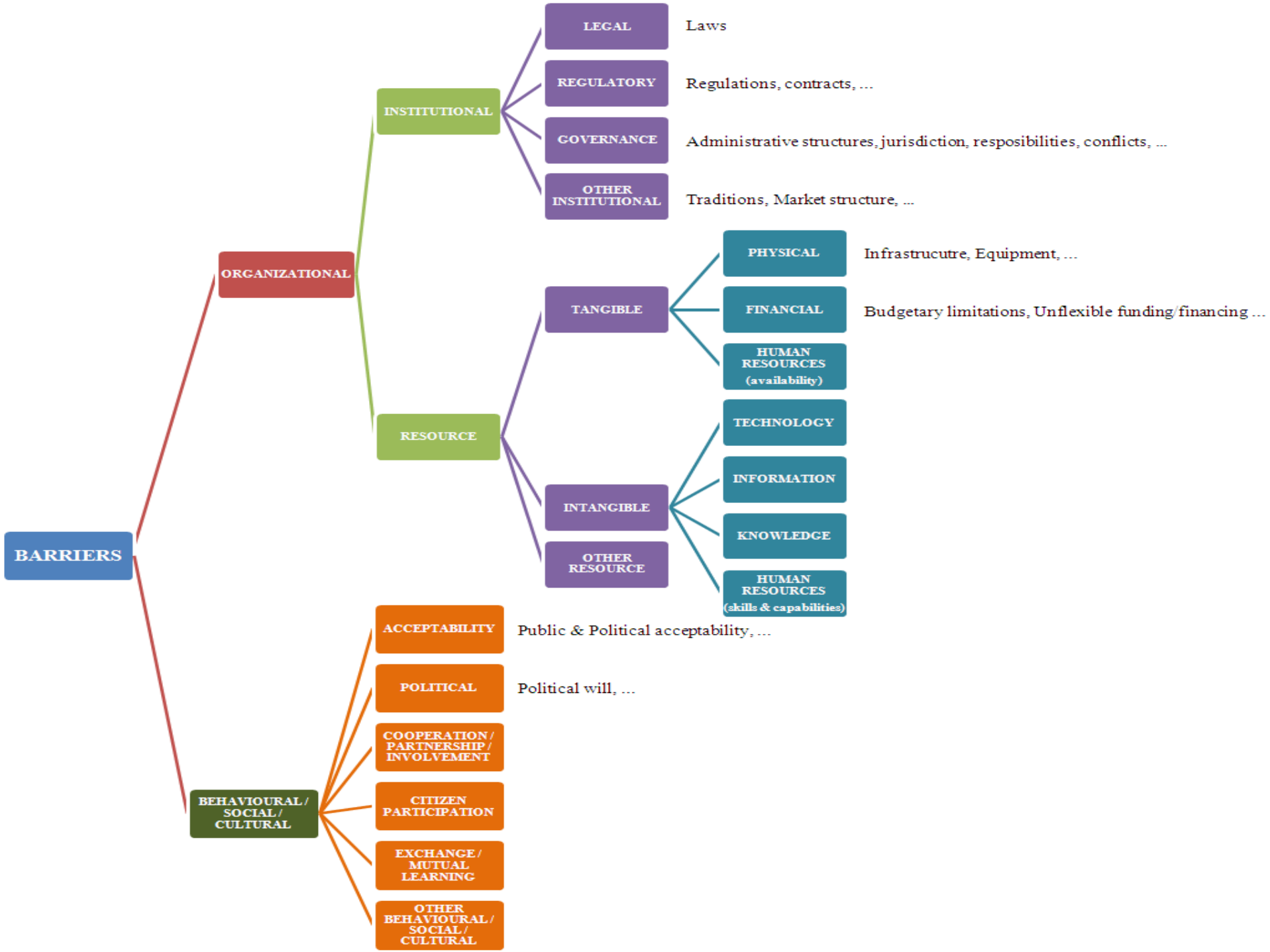
Flows among actors depend on institutional design



MATRIX of RESPONSIBILITIES

			Public – Private Partnership				
	Works and Service Contracts (conventional procurement)		Management and maintenance contracts		Operation and Management Concessions	Build – Operate – Transfer Concessions	Privati-zation
Type	Design, Bid, Build	Design, Build	Management contracts	Performance-based contracts	Lease or Franchise or Affermage Brownfield	BOT/DBFO/BOO Greenfield	
Design	Private by fee contract	Private by fee contract				Private by concession contract	Private
Build	Private by fee contract						
Operation and Maintenance	Public	Public	Private by fee contract	Private by Performance-based contract (PBC)	Private by concession contract		
Finance	Public	Public	Public	Public			
Own	Public	Public	Public	Public	Public	Public after contract (BOT/DBFO) or Private (BOO)	
Private Sector Revenue Options					Tolls (concession models)		
				Availability Payments* (PFI model)			
				Government guarantees and support Other support (e.g. insurance)			

City size	City characteristics				Financial Position		Possible Packages
	Severe environmental problems		Capital intensive public transport				
	Yes	No	High/low	Low	Strong	Weak	
Very large/large	√		√		√		Public sector self-financing
	√		√			√	Public/private partnership, full commercialization
		√	√		√		Public sector with subsidies
		√	√			√	Public sector with additional User/beneficiaries charges, Public/private partnerships, Full commercialization
Small/medium	√			√	√		Public sector self-financing
	√			√		√	Self-financing & additional User/beneficiaries charges to serve Self-financing, private finance
		√		√	√		Public sector with subsidies
		√		√		√	Public sector with additional User/beneficiaries charges Public/private partnerships, full commercialization


BARRIERS
ORGANIZATIONAL
INSTITUTIONAL
LEGAL
Laws
REGULATORY
Regulations, contracts, ...
GOVERNANCE
Administrative structures, jurisdiction, resposibilities, conflicts, ...
OTHER INSTITUTIONAL
Traditions, Market structure, ...
RESOURCE
TANGIBLE
PHYSICAL
Infrastrucutre, Equipment, ...
FINANCIAL
Budgetary limitations, Unflexible funding/financing ...
HUMAN RESOURCES (availability)
INTANGIBLE
TECHNOLOGY
INFORMATION
KNOWLEDGE
HUMAN RESOURCES (skills & capabilities)
OTHER RESOURCE
BEHAVIOURAL / SOCIAL / CULTURAL
ACCEPTABILITY
Public & Political acceptability, ...
POLITICAL
Political will, ...
COOPERATION / PARTNERSHIP / INVOLVEMENT
CITIZEN PARTICIPATION
EXCHANGE / MUTUAL LEARNING
OTHER BEHAVIOURAL / SOCIAL / CULTURAL

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Financial barriers

- Budgetary restrictions – scarcity of public money - non homogeneous at metropolitan level
  - ✓ Value management approach
  - ✓ Public agencies having to compete for public funds
- Conflicts of interest among public sector stakeholders
  - ✓ Planned program approach
  - ✓ Assessment of opportunity costs
- Rigidity, uncertainty and complexity
  - ✓ Funding pools dedicated to specific transport-related purposes entail advantages
  - ✓ Doesn´t allow for long-term financial planning of projects, investments and schemes

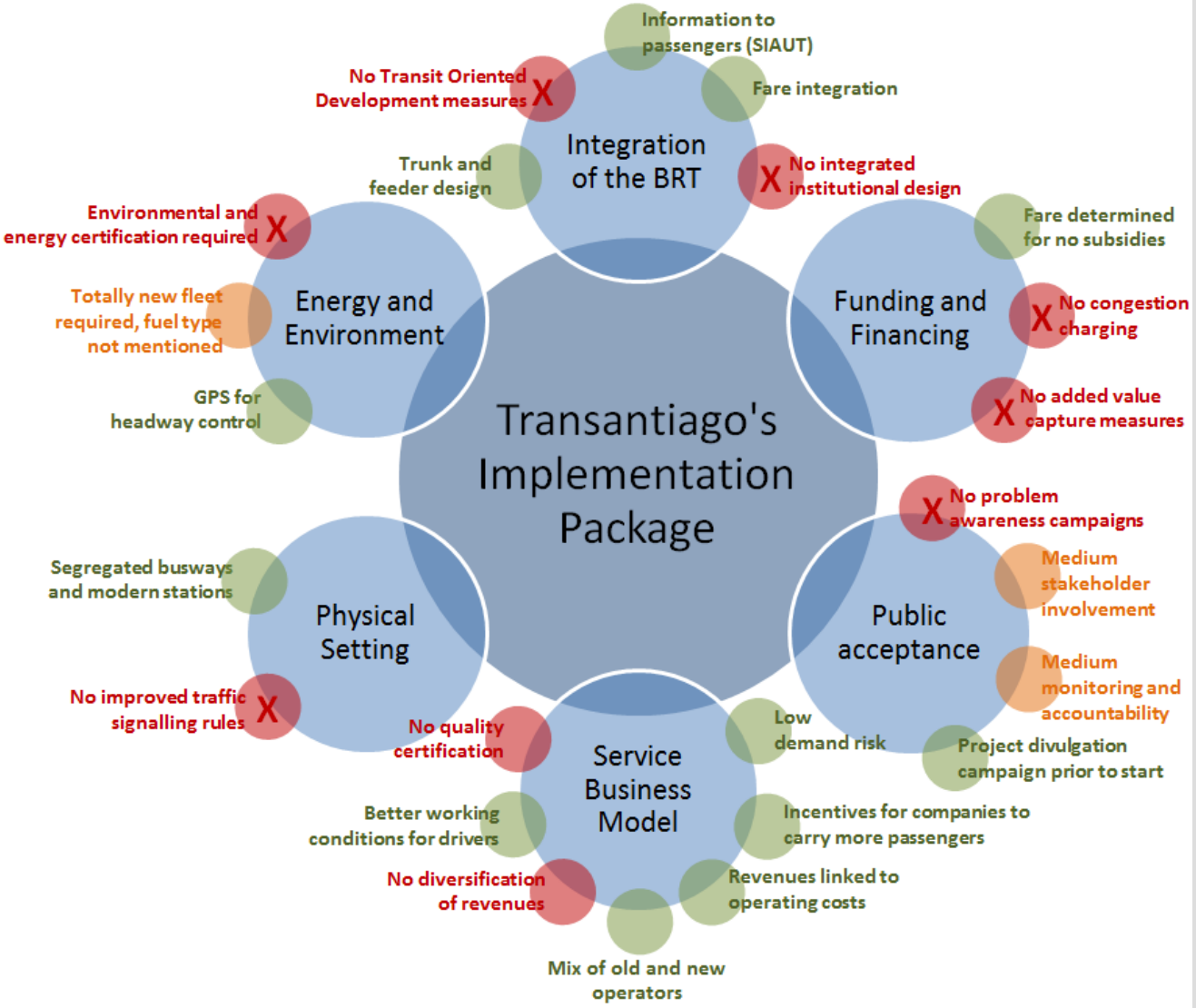
Decentralization constraints

- **Devolution of responsibilities** was not accompanied by the allocation of relevant financial autonomy to implement the decisions taken.

- **Bureaucratic structure** of intergovernmental financial flows process, as well the existence of political motivations that sometimes channel funding resources towards other non-transport projects

- **Low acceptability** on behalf of the citizens and their low willingness to pay new taxes or transport-related fees, which cause degradation of their end state situation, creates barriers to the expansion of the funding and financing tools and consequently increase of revenues

Project hinterland is critical for successful implementatipon



❒ Example: TARNSANTIAGO

Elements of the funding mechanism \ Reasons for failure	Scheme implementation failure	Type of scheme implemented	Change of scheme details	Reduced investment cost effectiveness	Delays to scheme delivery	Scheme cos increase
Amount of detail required in the production of bids					√	
Constraints imposed on how resources from some sources can be spent		√	√	√		
Constraints imposed on when resources can be spent				√		
Cost increases			√		√	
Delays to delivery						√
Difficulty in quantifying scheme benefits	√	√				
Funding criteria			√			
Inadequate planning					√	√
Lack of advance funding						√
Lack of political will	√	√	√			
Lack of suitably skilled staff	√				√	√
Necessity to meet funding stream bidding criteria	√	√	√	√		√
Phasing of funding provision		√	√		√	√
Relatively poor availability of revenue funding;	√	√	√	√	√	√
Scheme delay			√			
The partnership working process			√		√	√
Uncertainty of developer contributions		√	√	√	√	
Uncertainty of the bidding process	√				√	
Uncertainty over long term allocation and availability of resources				√		

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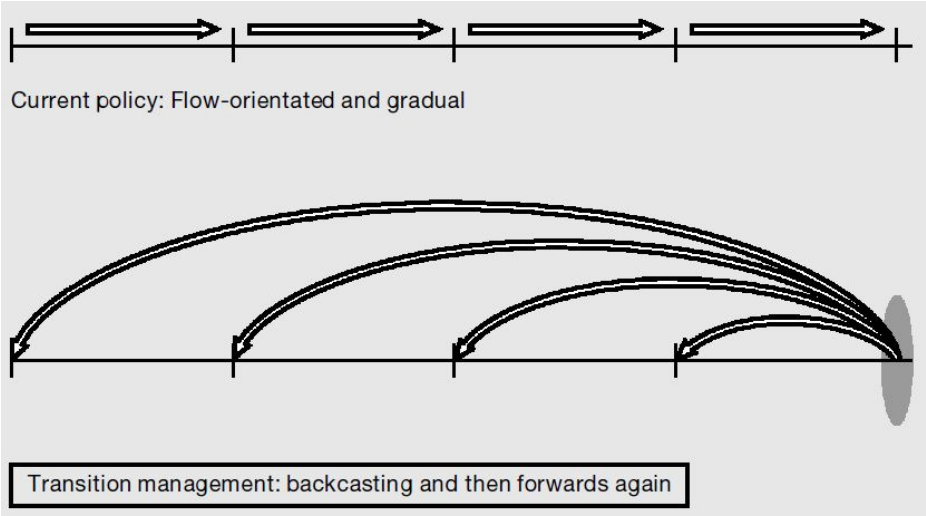
Ingredients to change PPP paradigm.

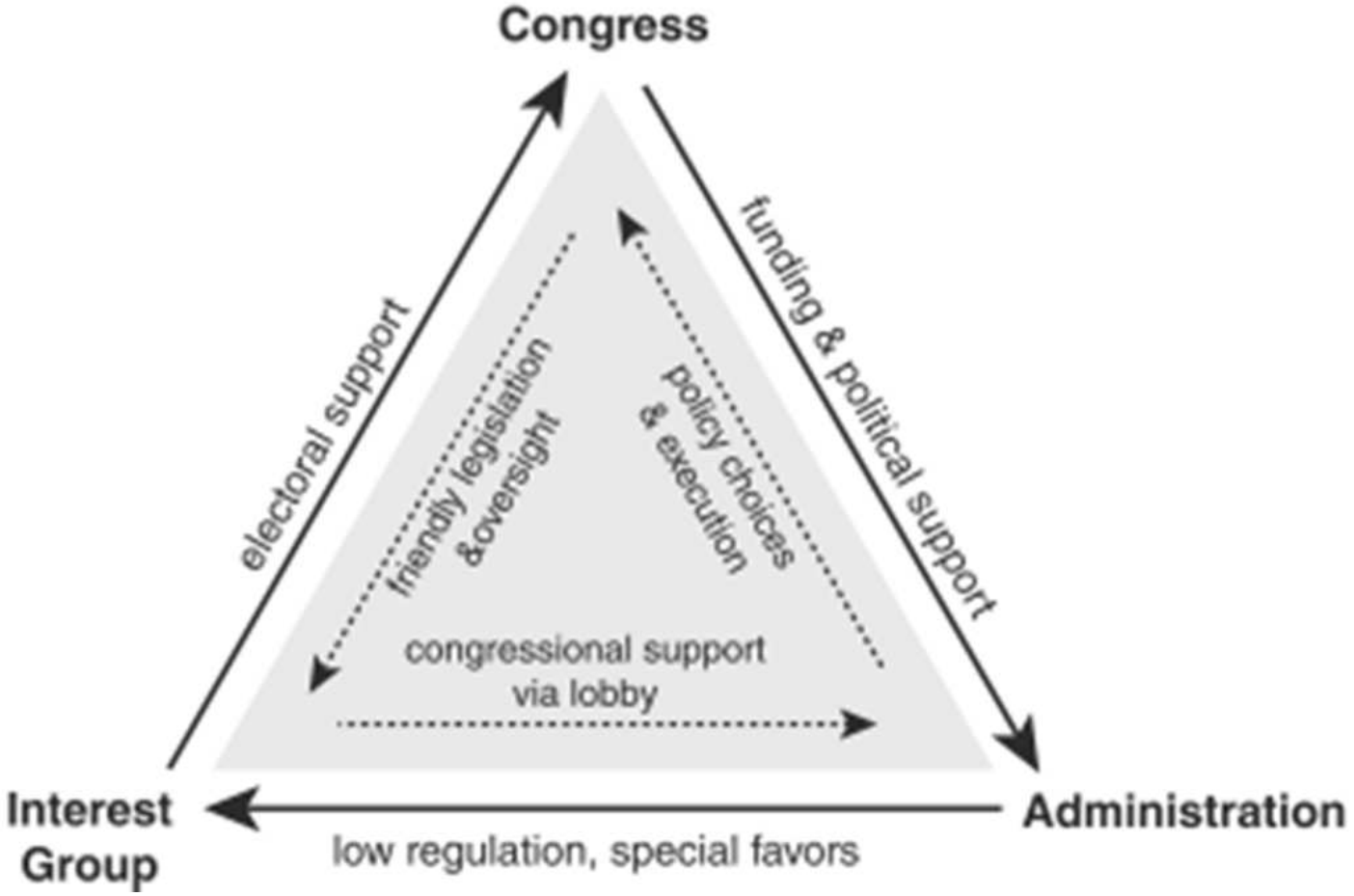
Missing elements: Long term vision Backcasting, evaluation, learning

- Short-term / operational / interim objectives are derived from the long-term vision in a back-casting process



- Transition management is complement, not opponent of current policy, as it brings a long-term into the process (innovation alongside optimization)

Missing elements: Coalitions



Schwartz, 2011

PPP is not a panacea, there are other financing options

- **Pricing for the use of infrastructure or services**:
  - is not only revenue raising,
  - it is mostly meant to manage the use and obtaining a better match between supply and demand (i.e. Vickrey dixit, mid 1950's)

- **Other instruments for value creation**
  - property value capture (e.g. China, Japan);
  - tax increment financing (or betterment levy) (e.g. Bogota);
  - capital recycling (e.g. Australia)

Weaknesses of traditional governance

- There has been:
  - Weak leading attitude.
  - Growing influence of international organizations
  - Greater transfer of power to regions and local government
- Limits in three dimensions:
  - Sustainability ***Goals*** are defined with some subjectivity and ambiguity
  - ***Knowledge*** on the complex and interdependent dynamics of society, technology and nature is not only limited but also contested and uncertain
  - ***Power*** to shape the structural changes in society is distributed across a wide range of actors and subsystems

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The value of ambivalence and uncertainty: functional maleability

- The concept of sustainability has “functional malleability”(vagueness, ambiguity, ambivalence) but this is a strength rather than a weakness:
  - Fueling and feeding from boundary work, which is a zone of negotiation of fuzzy contours, variable according to the issue
  - These may be a powerful resource for change, partly through the mobilization of public knowledge and partly through the development of greater reflexivity within scientific institutions

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The value of ambivalence and uncertainty: multiplicity of visions

- Accepting a multiplicity of 'visions' may be seen as a strategy to avoid premature 'lock-in', when costs and benefits of different technological alternatives are not yet clear and there is pervasive uncertainty about broader political, economic and technological developments.

  - But it can also be understood as a political strategy to draw groups linked to diverse technological alternatives into transition programmes

Participatory processes

- Participation processes may go through two different stages:
  - sometimes geared towards the **construction of collective and consensual visions** of what a more sustainable sociotechnical system might entail (thereby reducing ambivalence).
  - some other times deliberately designed to 'open up' rather than 'close down' differences of perspective in order to **work with ambivalence more purposefully** than before

The Public Decision Hurdle: How to assess Value for Money

- In theory, choice of the delivery model should be governed by search for the maximum "***value for money***" (VfM)
  - Meaning Net Present Value considering the whole lifecycle of the project (incl costs and benefits)
  - Difficult to estimate for the various delivery models (combined or segmented):
    - various agents in different contractual settings and probably over a time span of several decades
- The operational tool for assessment of models is the ***PSC – Public Sector comparator***,
  - Need to define the best model in Public Sector Procurement and assess its expected performance (the reference)
  - Need to make explicit all the risks retained by the State in both models

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Several Technical Risks across the stages in lifecycle

- Delays in design, coordination problems in the design team;
- Delays in design approval due to environmental assessment, public hearing or change of political preferences;
- Faults in design due to urgency from client;
- Construction delays or cost overruns due to adverse selection;
- O&M cost overruns due to moral hazard;
- Disputes about upgrade and modernization (fuzzy contracts);
- Cross stage competencies are still rare (this favours combined contracts, major risks of litigation). A competent State favors segmented contracts

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Policy capture by the contract

- When signing concession contracts with life spans of several decades, governments rarely consider possible **changes of policy** and they do happen.

- In most cases, governments have the authority to impose those changes but **only accompanied by a negotiation for financial rebalancing** (which always occurs under conditions of information asymmetry → very, very expensive!)

- This risk should always be explicitly assessed. When found significant**, shorter concession periods** are preferable with performance incentives

Leadership, not command

- Typically, **traditional governance lacks long-term visions** and remains confined to a top/down and expenditure / regulatory framework.
  - And environmental innovation has been divorced from more general policies for economic and social development.

- **Governments should lead the transition management process**
  - Not commanding, but inspiring collective learning and encouraging participation of other actors (stakeholders);
  - (Financial or notoriety) Incentives to newcomers, stimulate experiments, develop new partnerships, open discussions on desirable direction of change;
  - Assume open and incomplete agreements, allowing open coordination methods

Weaknesses of traditional governance

- Constraints in three dimensions:
  - ***Goals*** are defined with subjectivity and ambiguity
  - ***Knowledge*** on the complex and interdependent dynamics of society, technology and nature is not only limited but also contested and uncertain
  - ***Power*** to shape the structural changes in society is distributed across a wide range of actors and subsystems

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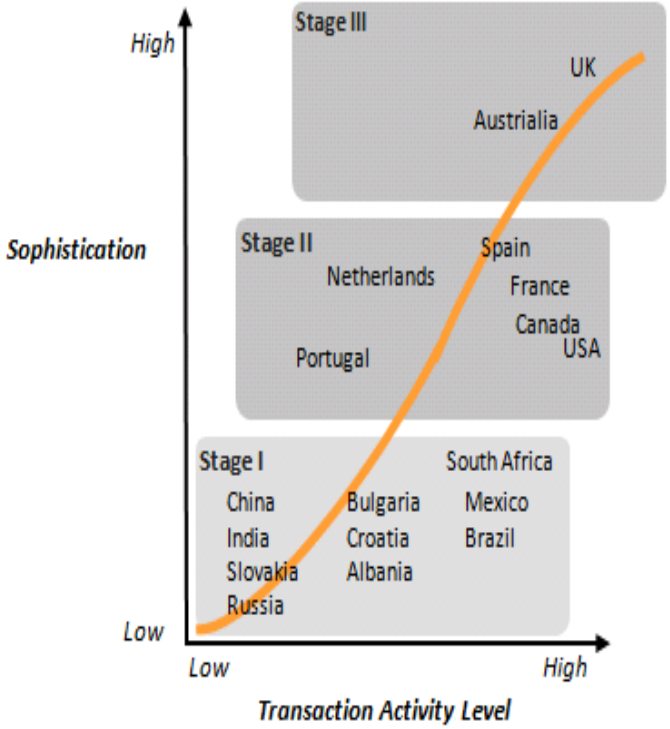
Evidence from institutional setting

- Overlap between **constitutional areas of responsibility** (e.g. national, state/province, regional, local)
- Overlap between quasi-constitutional **areas of government** (e.g. quasi-autonomous non-governmental bodies, public private partnerships)
- Decision-making **tradeoffs** that need to be made (e.g. allocating resources to one policy area and not to another.)
- Overlap between **policy sectors priorities** (e.g. industry, environment, transport, health,education, commerce, trade)

Maturity concept

PPP Market Maturity Concept

SCHEMATIC



- Use of more sophisitaced risk models
- Greater focus of total lifecycle model
- PPP Market place with penion funds and private equity funds
- Organizational and skill set changes in government to support greater role of PPPs

- Estalish dedicated PPP units in agencies
- Leverage new sources of funds from capital makets
- Use PPP to drive service innovation
- PPP markets gains depth – expanded to multiple projects and sector

- Policy and legal framework established
- Decision public procurment vs. PPP on Public Sector Comparator (PSC) model
- Initiate central PPP policy unit to guide implementation
- Develop deal structures, get transactions rightand begin to build marketplace
- Apply early lessons from transport to other sectors

Source: Eggers and Startup, 2006

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Missing elements: Value approach

- **For Value Focus**:
  - Value perceived by user
  - Value for service providers
  - Value for lenders
  - Value for State

- **For Value Capture**:
  - Systemic integrated approach
  - Strategic perspective

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CONCLUSIONS

Conclusions

- **Funding and financing are critical elements of the system**, directly influenced by the institutional settings and their reforms, and at the same time influencing the institutional arrangements they are embedded in, through the financial barriers and constraints.

- Strong evidence that there exists **no universal best funding and financing configuration** for public transport systems, but we could reconfirm that identifying difficulties, future trends and taking account the local context provide a satisfactory base framework for successful strategies

- New strategies and instruments should **build on value approach paradigm**

- The countries, regions, cities and urban areas must recognize how they are perceived by individuals and corporations, and be managed under that perception of competitive pressure, that is **they must be seen as an economic agent.**

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Key challenge for next generation of PPPs: Move towards value creation and capture

Thank you for your attention !

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