

Collaboratory for Research on Global Projects  
at Stanford University



# Project Viability Screening:

*A method for early-stage merit-based project selection*

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# Roadmap

- ❑ **Motivation – Shift from Public to Project Finance**
- ❑ Current Practice – Contractors, Infra Funds, Rating Agencies, Government Agencies
- ❑ Theory – Finance, Economics
- ❑ New Method – Project Viability Screening
- ❑ Implications for Theory & Practice

# Motivation

- ❑ Many people are calling for P3s out of desperation, recognizing old system is broken, not knowing what the new P3 system means
- ❑ What the shift to P3s means, is that we shift from the world of public finance to the world of project finance
- ❑ This forces a shift in paradigms:
  - ❑ Old paradigm: public works, politicians cut ribbons
  - ❑ New paradigm: infrastructure investment, bankers run cash flow models
- ❑ More emphasis on project screening and selection, project level economics, and structuring to ensure value!
  - ❑ And hopefully, fewer white elephants!

# What Does the Shift from Public to Project Finance Mean?

	<b>Public Finance</b>	<b>Project Finance</b>
<b>Underlying Logic</b>	Social returns; public works	Economic returns; market imperatives
<b>Borrower</b>	Public entity	Single-asset project company
<b>Source of Debt Repayment</b>	Typically general tax collections (except revenue-based bond issues)	Typically project revenues (except gov't guarantees or availability payments)
<b>Rating Agency Focus in Creditworthiness Assessment</b>	Strength of the tax base and existing levels of indebtedness of public entity	Project revenue forecasts; Debt service coverage ratios; Project contracts
<b>Who Drives Process?</b>	Elected officials	Financial executives

# What Does the Shift from Public to Project Finance Mean? (con't)

<b>How are Projects are Selected &amp; Prioritized?</b>	Politicians—like jobs, expansion of tax base, special interests	Financial executives—watch risk-adjusted returns, hurdle rates
<b>What Happens if Project Runs Over Budget/Schedule?</b>	More tax money is allocated; politicians make excuses; project limps along; No feedback loop	Private investors lose capital; project is restructured; sometimes gov't steps in
<b>Exit Strategy</b>	N/A	Sell to investors
<b>Main Criticisms</b>	Too many white elephants; Parochial selection process; Inefficient delivery; Deferred maintenance	Too many toll roads; User fees restrict access; Natural monopolies can be abused

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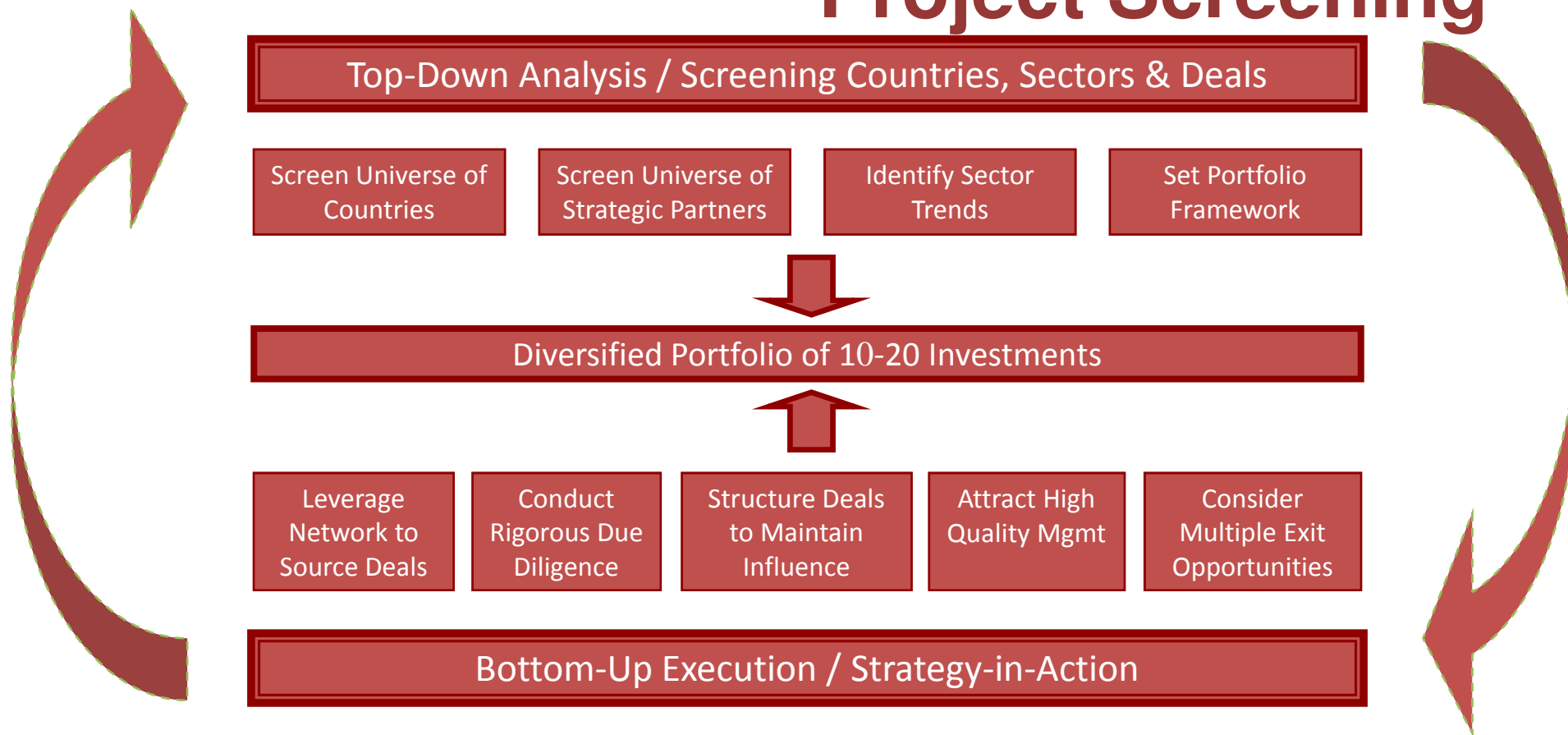
# Contractor Methods for Project Screening

- ❑ Seasoned industry veterans do “business development”
- ❑ Leads from trade journals, business partners, past clients
- ❑ Competitive bidding, proposal writing, lobbying
- ❑ Checklists used to summarize attractive project characteristics

## Skanska's 5 Questions

- Is it legal (supported by legislation)?
- Is there political will?
- Is there institutional capacity?
- Is the project economically viable or will the government provide financial support?
- How does the project integrate into the regional infrastructure?

# Infrastructure Fund Methods for Project Screening



- ❑ Proactive, funnel-based, driven by sector and geographic targets
- ❑ Deal-seekers and intermediaries are paid large success fees
- ❑ Investment memo is presented to investment committee to gain budget for deep-dive due diligence

# Rating Agency Methods for Project Screening

- Rating agencies distill project success factors into detailed rating methodologies
- Cross-disciplinary rating teams vote to assign a rating

## Moody's Rating Methodology for Toll Roads

Key Factor	Weighting
Asset Type	20%
Fundamentals of Service Area	10%
Traffic Profile	10%
Concession & Regulatory Framework	10%
Stability of Business Model & Financial Structure	10%
Key Credit Metrics	40%



FitchRatings

STANDARD  
& POOR'S

# Rating Agency Methods for Project Screening

## □ Further breakdown of rating factors:

Factors	Sub-Factors	Weighting
Asset Type	Asset Features	10.00%
	Competing Routes	10.00%
Fundamentals of Service Area	Robustness and Diversity of Service Area	5.00%
	GDP / Capita in Service Area	5.00%
Traffic Profile	User Profile	3.33%
	Track Record and Stability of Tolloed Traffic	3.33%
	Annual Average Daily Traffic per Lane Km	3.33%
Concession and Regulatory Framework	Risk of Adverse Changes to Concession Terms and Conditions	3.33%
	Ability to Increase Tariffs	3.33%
	Protection against Events outside the Concessionaire's Control	3.33%
Stability of Business Model and Financial Structure	Ability and Willingness to Pursue Opportunistic Corporate Activity	3.33%
	Ability and Willingness to Increase Leverage	3.33%
	Targeted Proportion of Revenues outside Core Concession	3.33%
Key Credit Metrics (Historical & Projected)	Cash Interest Coverage	8.00%
	FFO / Debt	8.00%
	Moody's Debt Service Coverage Ratio	8.00%
	RCF / Capex	8.00%
	Debt / PV Base Cash Flows or Concession Life Coverage Ratio	8.00%

# Government Methods for Project Screening

- ❑ Seldom done at all, typically money allocated by:
  - ❑ Politics, patronage, parochial processes
  - ❑ Formula-based allocations
- ❑ Very few countries have merit-based, criteria-driven approaches:
  - ❑ Chile, Mexico, etc.

## Mexico Case Study

- Salinas - Council of Ministers
- 10 projects of national importance funded early-90s
- Today, four ranking criteria:
  - Socio-economic benefit
  - Pro-poor development
  - Regional impact
  - Synergies with other projects
- Application review process
  - Ministry of Finance ranks & assigns single number
  - Blocks powerful senators

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# Modern Finance Theory

Method	Description	Benefits	Drawbacks
Payback Period	$\frac{\text{Initial costs}}{\text{Annual profits}}$	Simple Emphasis on liquidity	Lack of information on profitability and timing of cash flows
Net Present Value	$NPV = \sum_{n=0}^N \frac{C_n}{(1+r)^n}$	Accounts for time value of money	Sensitive to discount rates
Internal Rate of Return	$NPV = \sum_{n=0}^N \frac{C_n}{(1+r)^n} = 0$	Accounts for time value of money	Ignores scale; Difficult with negative cash flows
Real Options	Calculates NPV due to added flexibility	Accounts for risks of individual project cash flows	Sensitive to discount rates; Complicated

## General Drawbacks:

- Uncertainty of cash flows
- Narrow view
- Lack of qualitative considerations

# Modern Economics Theory

- ❑ Why should government invest in capital projects?
- ❑ Resolve market failures
  - ❑ Public goods, externalities, monopolies
- ❑ Improve general welfare
- ❑ The Kaldor-Hicks rule
  - ❑ Benefit-cost analysis
  - ❑ If the gain from the gainers is greater than the loss from the losers, then proceed with the project

## General Drawbacks:

- Promotes a “good enough” mentality
- Tolerates sub-par allocation of resources

# Assumptions in Modern Finance Approaches

- Assumptions in current finance approaches:
  - Projects are mutually exclusive
  - Project definition & information is complete
  - Costs, cash flows, and risks are known and quantifiable
  - Financial rate of return is the only decision driver

# Assumptions in Modern Finance Approaches

## ❑ Assumptions in current finance approaches:

❑ Projects are normally evaluated

❑ Projects are normally evaluated

❑ Cost-benefit analysis is used

quantified

❑ Financial rate of return is the only decision driver

**NOT TRUE!!!**

## ❑ Current theory is insufficient, seldom used outside the classroom

❑ Projects must be socially, politically, legally, technically, economically, and financially viable!

# Intuition

- ❑ We need a new method to guide project selection in the real world, where:
  - ❑ Constrained by limited time & resources
  - ❑ Abundance of possible projects
  - ❑ Scope of each project is inconsistently defined
  - ❑ Costs, cash flows, and risks are known only vaguely
  - ❑ Multiple decision criteria are important
  - ❑ Premature lock-in could limit further exploration

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# Project Viability Screening (PVS)

- ❑ Merit-based analysis to rank and prioritize projects using a defined set of project viability criteria (PVC)
- ❑ Heuristic-driven approach that mimics current practice
- ❑ Intended for early-stage efforts when selection process is limited by time and resources
- ❑ Supports multiple decision-criteria, not just financial rate of return
- ❑ Developed after studying 10 different project ranking methods

# Project Viability Screening

**Step 1:**

**Establish Integrated Team**



**Step 2:**

**Develop Project Viability Criteria**



**Step 3:**

**Deal-Breaker Screening**



**Step 4:**

**Project Viability Screening**



**Step 5:**

**Prepare Project Short-List**



**Step 6:**

**Prepare Feasibility/Business Case**



**Step 7:**

**Obtain Board Approval**

# 1. Establish Integrated Team

- ❑ Seek to assemble team with holistic knowledge of projects, politics, stakeholders, market trends, history & current issues
- ❑ Define roles, responsibilities & critical communication links between stakeholders
- ❑ Adjust team membership and size in response to changes in assignments

## 2. Develop Project Viability Criteria

- ❑ Familiarize team with all projects
- ❑ Clearly define project selection process
- ❑ Identify project viability criteria and deal-breakers
- ❑ Consider time constraints, resources, and final goals

### **Case Study – California Transportation Sector:**

1. Environmental permits
2. Regional political support
3. Viability of plan of finance
4. Social benefit-cost ratio
5. Value-add of private sector

# Project Viability Criteria

## Category 1

### Non-Rankable Attributes

*Project criteria that  
generally cannot be  
ranked*

#### **Examples:**

Project Location?  
Type of Project?  
Champion?

## Category 2

### Project Viability Attributes

*Project criteria that  
determine whether it  
is advisable to invest*

#### **Examples:**

Social Benefit/Cost?  
Enhances Regional  
Integration?  
Public Support?  
Political Feasibility?

## Category 3

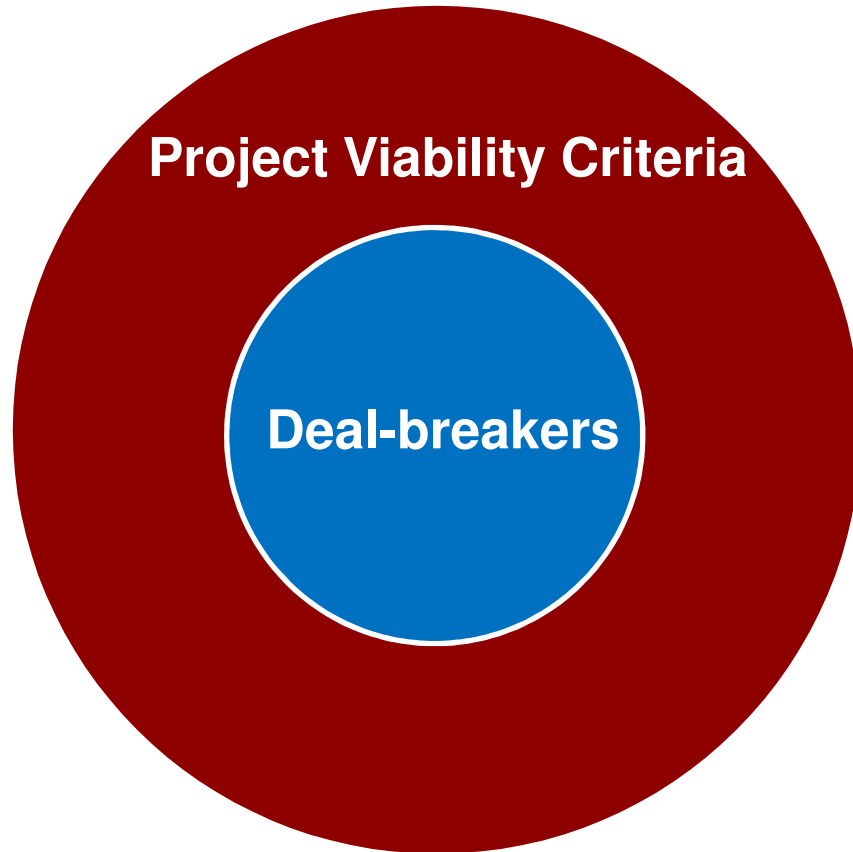
### Delivery Modality Attributes

*Project criteria that  
determine the most  
favorable delivery  
vehicle*

#### **Examples:**

Complexity?  
Innovativeness?  
Scale?  
Fast-track?

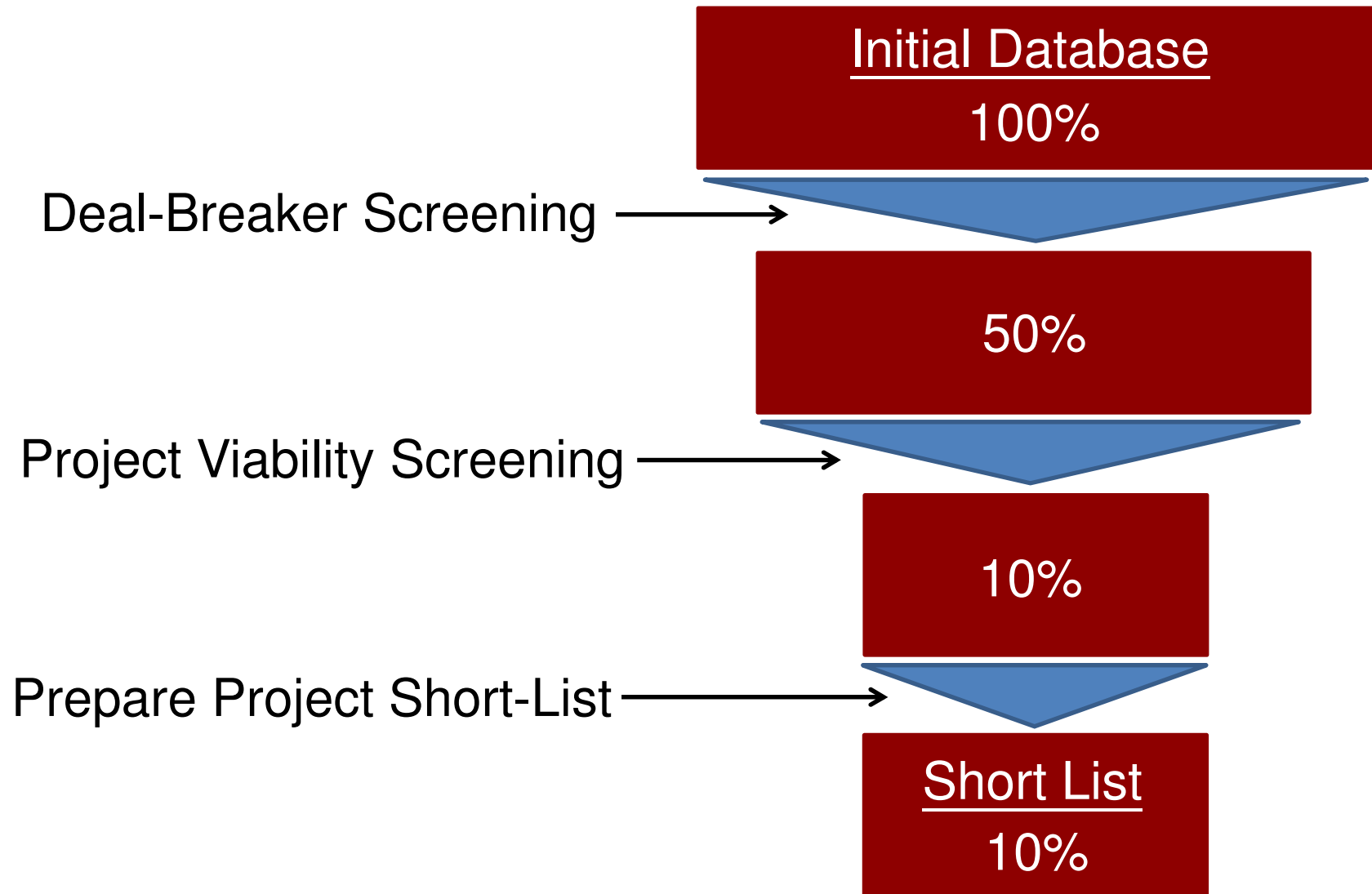
# Project Viability Criteria



- Environmental Permits
- Social Cost/Benefit
- Public Support
- Political Feasibility
- Jurisdictional Complexity
- Constructability
- Revenue Source
- Investor Interest
- Enabling Legislation

**Deal-breakers** are fatal flaws in projects that would prevent project success.

# Conduct Project Screening



## 3. Deal Breaker Screening

- ❑ Deal breakers are usually sector specific
- ❑ Hydro-Electric Dam
  - ❑ Steep creek, road to top, transmission
- ❑ Ports
  - ❑ Location and size of economy, diversity of cargo, transportation infrastructure
- ❑ Toll Roads
  - ❑ Competing routes, connection to large trunk routes, GDP/capita, type of traffic (commuter vs. freight vs. leisure)

## 4/5. Project Viability Screening & Preparation of Short-List

- ❑ Assign quantitative scores & weights to criteria
- ❑ Perform relative ranking, watch for “order of magnitude” differences in ranks
- ❑ Prepare short-list of top 10% for detailed feasibility study



## 6. Feasibility Study/Business Case

- ❑ Articulate project scope & schedule
- ❑ Complete stakeholder mapping
- ❑ Assess GDP & job growth benefits
- ❑ Perform detailed benefit-cost analysis
- ❑ Prepare cash flow model
  - ❑ Market study & revenue forecast
  - ❑ Construction cost estimate
  - ❑ Phasing plan



## 7. Obtain Board Approval

- ❑ Sell the project internally to the chief secretary, congress, legislature, board, commission, etc.
  - ❑ Tell a story – power point, you tube, local news
  - ❑ Citizen Advocates – find good spokespeople
  - ❑ External Advocates – “we did it too & it worked”
  - ❑ Petitions – strength in numbers





# UBS

## Example - Screening Matrix

Key Criteria	Individual/Discrete Assets												
	New Jersey Lottery	Atlantic City Expressway	New Jersey Turnpike	Garden State Parkway	HOT Lanes	Newly-Tolled Facilities	Development Rights at NJ Transit Stations	Naming Rights	PNC Bank Arts Center	Atlantic City International Airport (ACIA)	Fiber Optic Network	NJSEA <sup>1</sup>	HESAA
Scope (i.e., Discrete Project)	+++	+++	+++	+++	+++	++	+++	+++	+++	+++	+	++	++
Size	+++	+++	++	++	+ (?)	++	++	+++	++	++	++	++	++
Time	++	++	++	++	++	++	+	++	++	+	+	-	+
Skill-Sets	+++	+++	+++	+++	+++	+++	++	++	++	+++	++	++	++
Financeable	+++	++	++	++	++	+++	++	++	++	+++	++	-	---
Interfaces	+	+++	+++	+++	+++	-	--	++	+	--	+	-	+
Legal Platform <sup>2</sup>	++	+++	+++	+++	+++	++	+++	+++	+++	+	+++	+++	+++
Technical Information	+++	++	++	++	+	+	++	++	+++	+	+	+++	++
Land Ownership	NA	++	++	++	+ (?)	+++	+ (?)	+	++	-	NA	+	NA
Economically Sound	+++	+++	+++	+	++	+++	+	++	++	++	+	-	---
Overall Potential	+++	+++	++	++	++	++	++	++	++	++	+	+	-

+++ Very Favorable    ++ Favorable    + Somewhat Favorable    - Somewhat Unfavorable    -- Unfavorable    --- Very Unfavorable    NA: Not Applicable

Notes:

1 Reflects a group of 7 venues

2 Assuming enactment of appropriate legislation

(?) Additional due diligence required



**UBS**

# Example - Screening Matrix

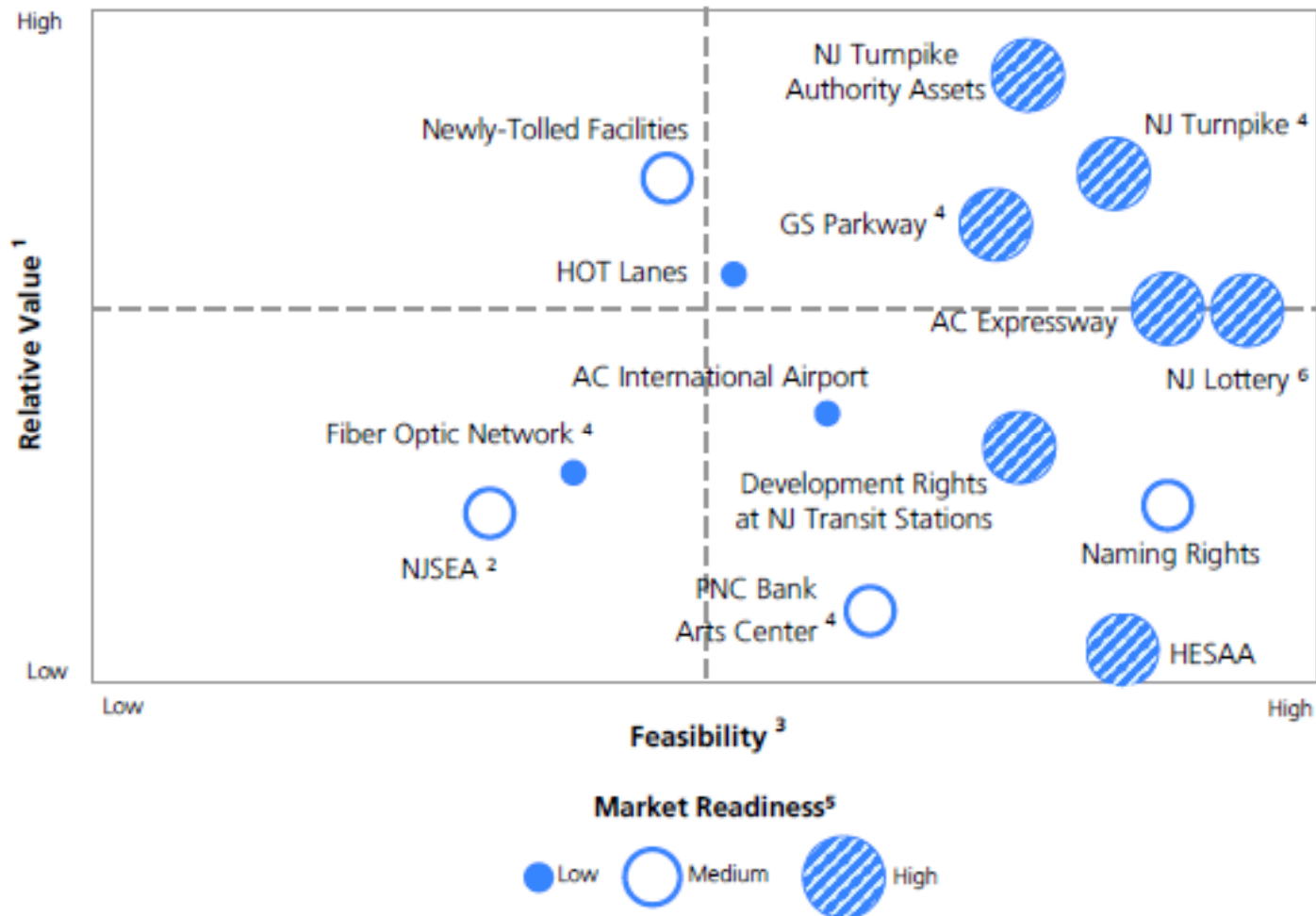
	Tier 1 Assets				
	Atlantic City Expressway	Development Rights at NJ Transit Stations	Garden State Parkway <sup>1</sup>	New Jersey Lottery	New Jersey Turnpike <sup>1</sup>
<b>Investment Profile</b>					
Predictable earnings and cash flow	+++	-	+++	+++	+++
Potential for clear regulatory framework	+++	NA	+++	++	+++
Monopoly characteristics	+++	++	+++	+++	+++
Growth potential	++	++	+++	+++	+++
Low volatility	+++	++	+++	++	+++
Low correlation of returns compared to other asset classes	+++	+	+++	+	+++
Marketable asset size	++	+++	++	+++	++
Capital expenditures	++	+++	++	++	++
Potential for O&M enhancements	+++	NA	++	+	+++
Yield potential	++	NA	++	+++	+++
<b>Expected Investor Interest</b>					
Strategic/industry acquirers	+++	++	+++	+++	+++
Financial sponsors	++	+	++	+++	++
Listed/public equity investors	+++	+	+++	+++	+++
Infrastructure funds	+++	NA	+++	+++	+++
Bank debt providers	+++	++	+++	+++	+++
Debt capital markets	+++	++	+++	+++	+++

+++ Very Favorable    ++ Favorable    + Somewhat Favorable    - Somewhat Unfavorable    -- Unfavorable    --- Very Unfavorable  
NA: Not Applicable

Note:

<sup>1</sup> Included in NJ Turnpike Authority Assets which are not individually available without total NJ Turnpike Authority debt defeasance

# Example - Screening Graph



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# Implications for Theory

- ❑ Overcomes assumptions and removes overconfidence associated with financial theory (i.e. NPV, IRR)
- ❑ Goes beyond the notion of merely improving “General Welfare,” to trying to maximize it
- ❑ Underpins current practice with a conceptual model

# Implications for Practice

- ❑ Effective under limited time & resources
- ❑ Merit-based
- ❑ Criteria can be customized to meet local goals
- ❑ Applicable to all sectors
- ❑ Focuses attention on “high grade” opportunities

# References

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