

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?

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

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

How are Projects are Selected & Prioritized?	Politicians—like jobs, expansion of tax base, special interests	Financial executives—watch risk-adjusted returns, hurdle rates
What Happens if Project Runs Over Budget/Schedule?	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
Exit Strategy	N/A	Sell to investors
Main Criticisms	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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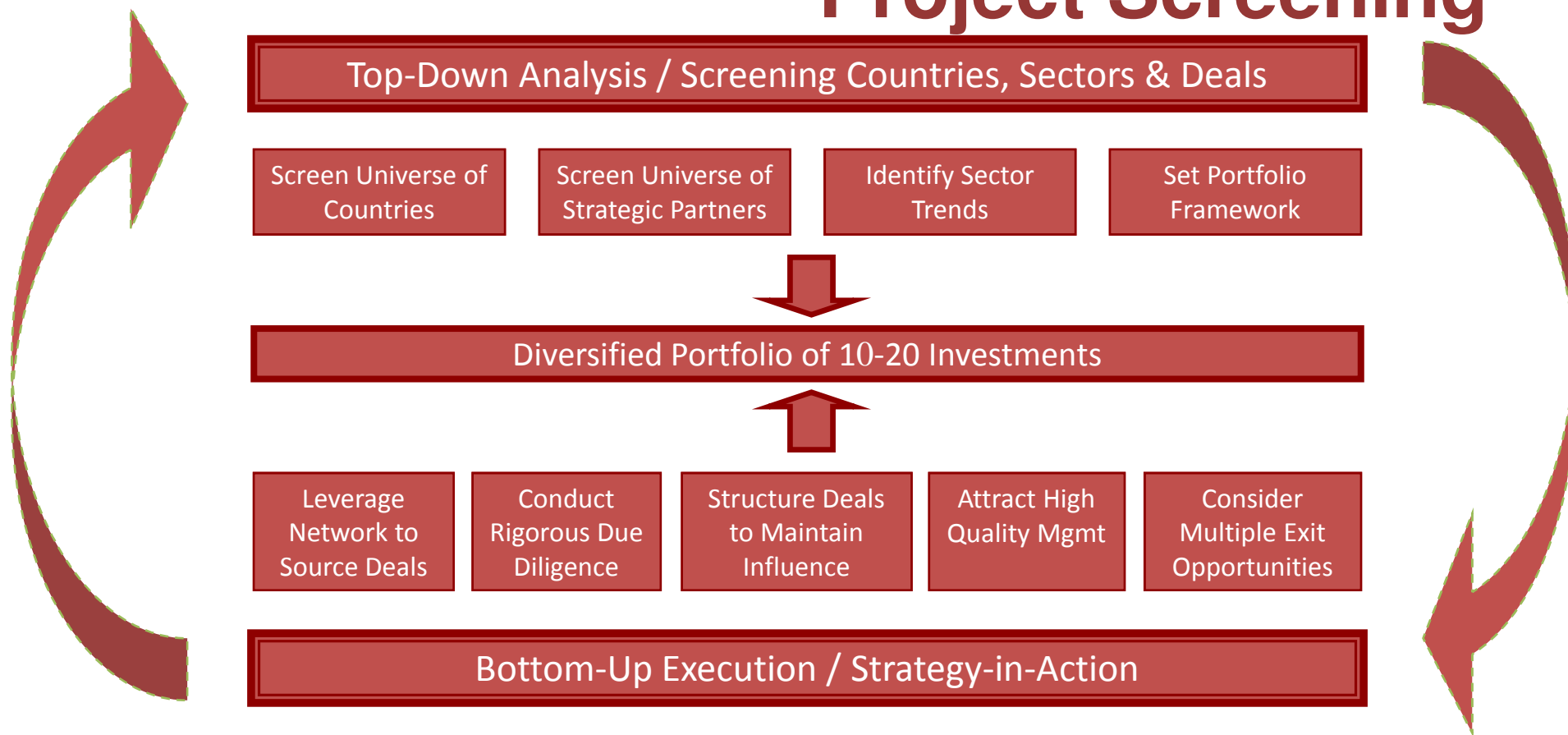
Contractor Methods for Project Screening

- ❑ 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

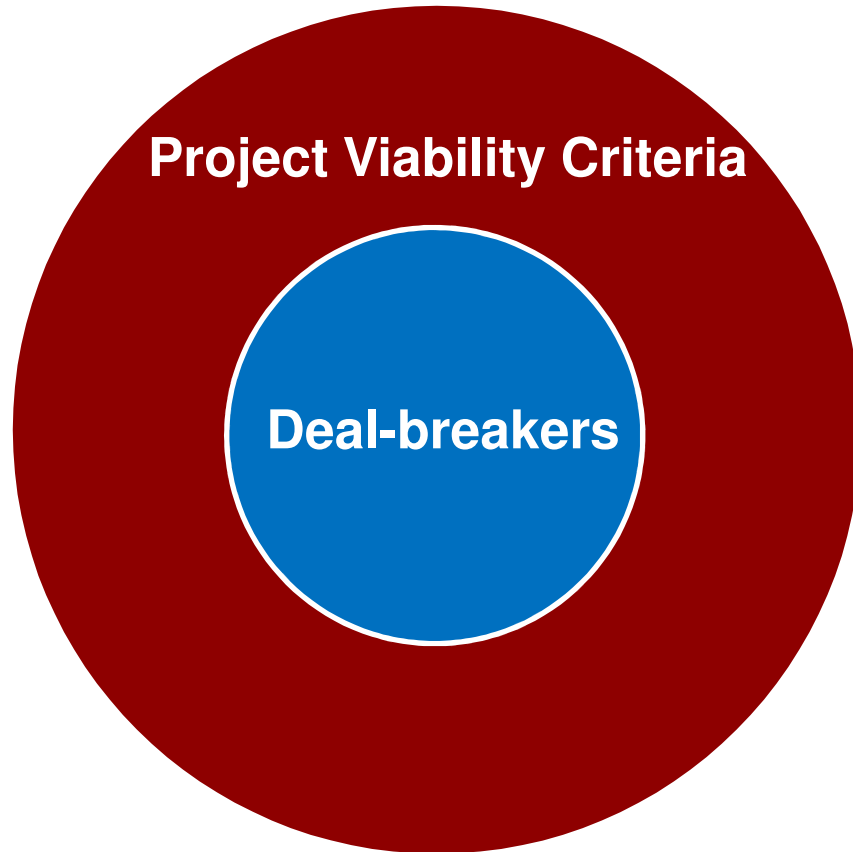
Delivery Modality Attributes

*Project criteria that
determine the most
favorable delivery
vehicle*

Examples:

Complexity?
Innovativeness?
Scale?
Fast-track?

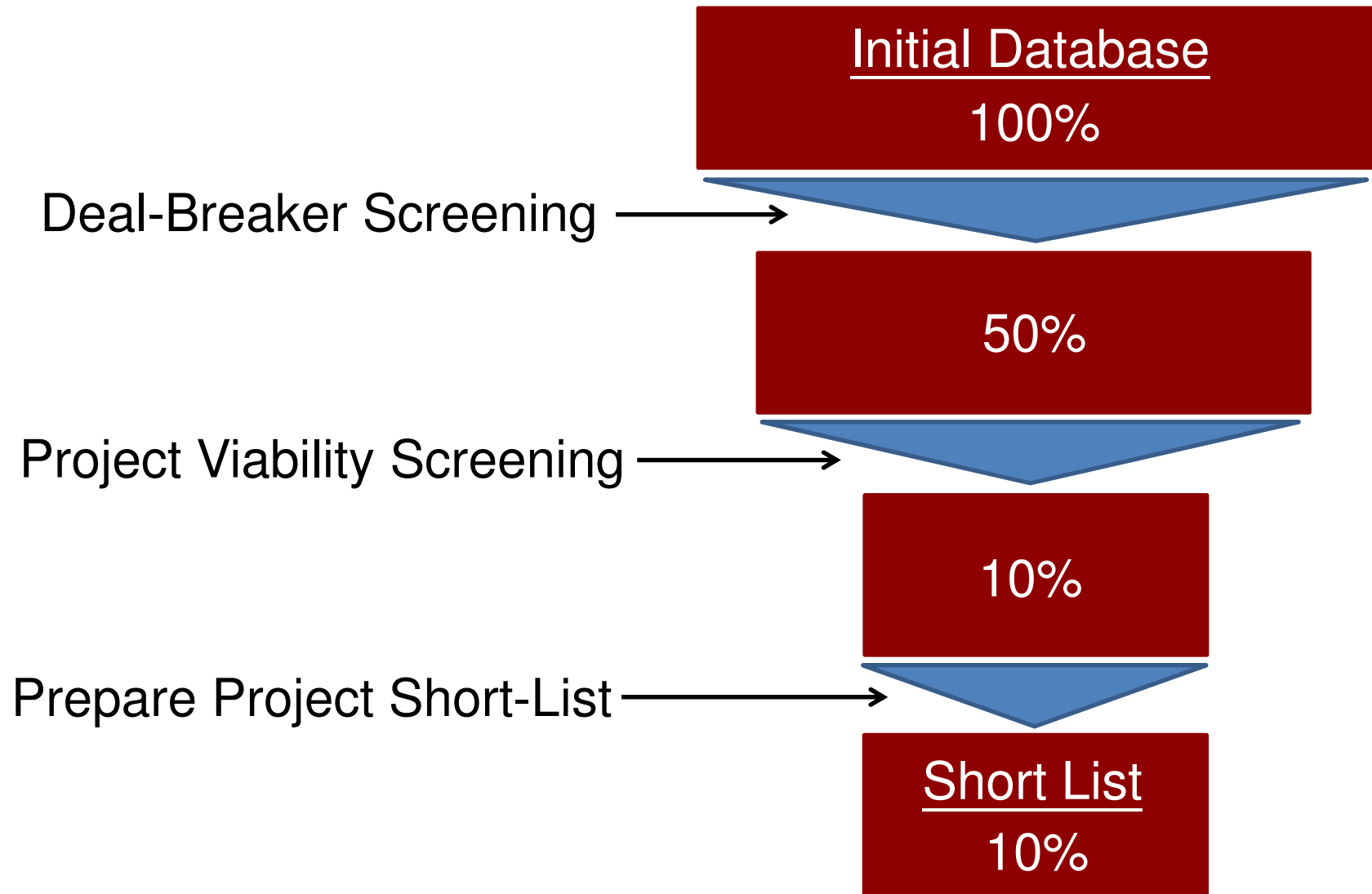
Project Viability Criteria



- 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 ¹	HESAA
Scope (i.e., Discrete Project)	+++	+++	+++	+++	+++	++	+++	+++	+++	+++	+	++	++
Size	+++	+++	++	++	+ (?)	++	++	+++	++	++	++	++	++
Time	++	++	++	++	++	++	+	++	++	+	+	-	+
Skill-Sets	+++	+++	+++	+++	+++	+++	++	++	++	+++	++	++	++
Financeable	+++	++	++	++	++	+++	++	++	++	+++	++	-	---
Interfaces	+	+++	+++	+++	+++	-	--	++	+	--	+	-	+
Legal Platform ²	++	+++	+++	+++	+++	++	+++	+++	+++	+	+++	+++	+++
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



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Example - Screening Matrix

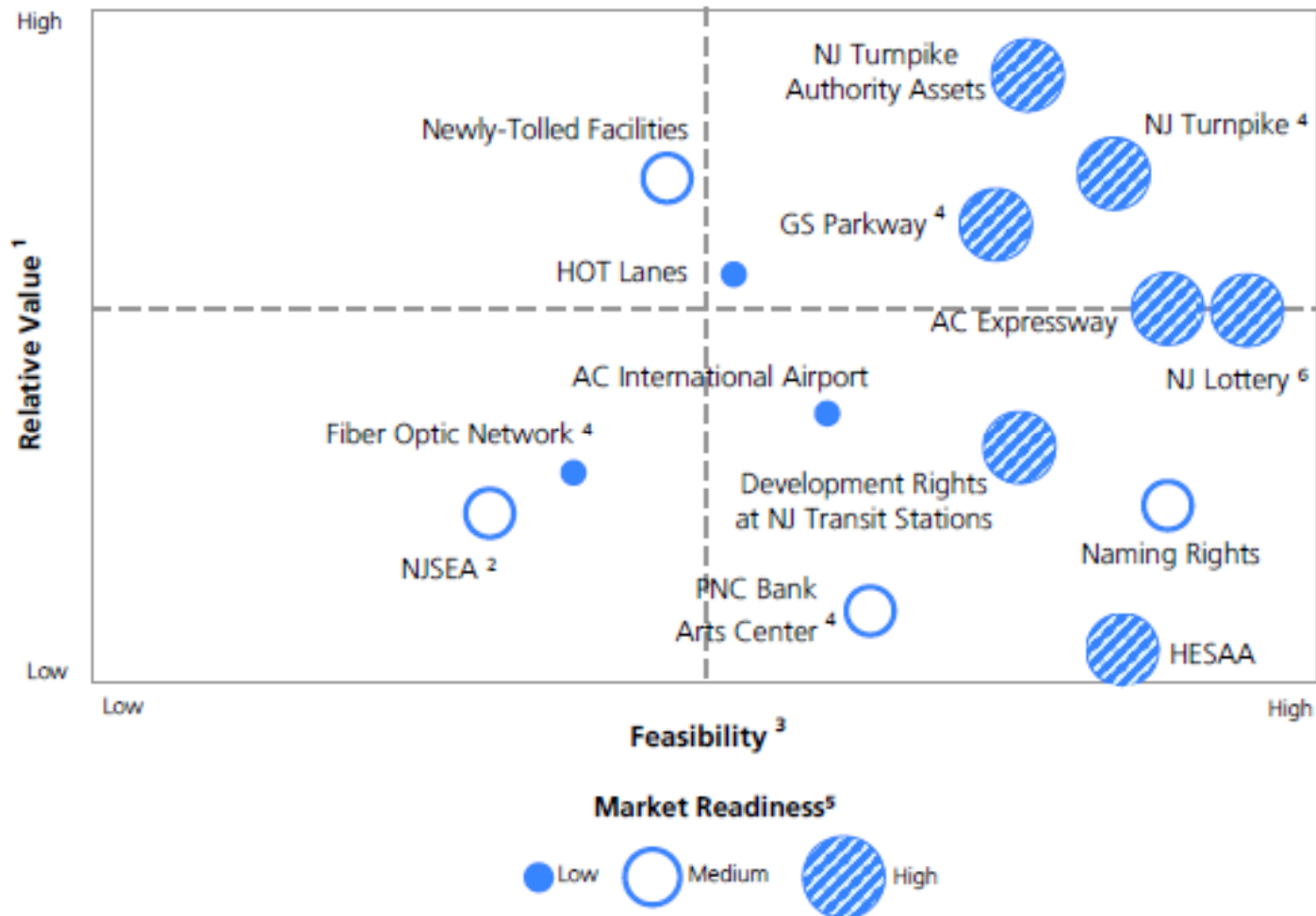
	Tier 1 Assets				
	Atlantic City Expressway	Development Rights at NJ Transit Stations	Garden State Parkway ¹	New Jersey Lottery	New Jersey Turnpike ¹
Investment Profile					
Predictable earnings and cash flow	+++	-	+++	+++	+++
Potential for clear regulatory framework	+++	NA	+++	++	+++
Monopoly characteristics	+++	++	+++	+++	+++
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	++	+++	+++
Expected Investor Interest					
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:

¹ 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

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