

# **The Rewards and Risks of Private Equity in Infrastructure**

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# Summary: As an infrastructure funding source, private equity brings rewards and risks

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- The U.S. needs new sources to finance its infrastructure
- Public-private partnerships (P3s) can serve as an additional funding tool
- Private equity benefits P3s
- Private equity creates certain risks, however, primarily due to duration pressures
- Private equity can serve as a funding source, under certain conditions

# U.S. Demand for Infrastructure

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# Infrastructure needs are increasing

## Summary of Range of “High” Average Annual Capital Investment Levels Analyzed for All Modes (Billions of Constant Dollars)

	Currently Sustainable <sup>1</sup>	Range Through 2020		Range Through 2035		Range Through 2055	
		From	To	From	To	From	To
Highway	\$68	\$207	\$240	\$182	\$250	\$185	\$276
Transit	\$13	\$21	\$32	\$23	\$34	\$26	\$46
Freight Rail	\$4	\$5	\$7	\$5	\$7	\$6	\$8
Passenger Rail	\$1	\$7	\$7	\$9	\$9	\$8	\$8
<b>All Modes Combined<sup>2</sup></b>	<b>\$86</b>	<b>\$241</b>	<b>\$286</b>	<b>\$220</b>	<b>\$301</b>	<b>\$225</b>	<b>\$338</b>

<sup>1</sup>The estimated “Currently Sustainable” funding for highways and transit is based on short-term Federal Highway Trust Fund revenue projections and assumes State, local, and private funding remains steady in constant dollar terms (i.e., growth equals inflation), while the estimate for freight rail assumes that private freight rail capital investment keeps pace with revenue growth. The amount shown for intercity passenger rail assumes estimated current capital investment by Amtrak and State governments remains steady in constant dollar terms.

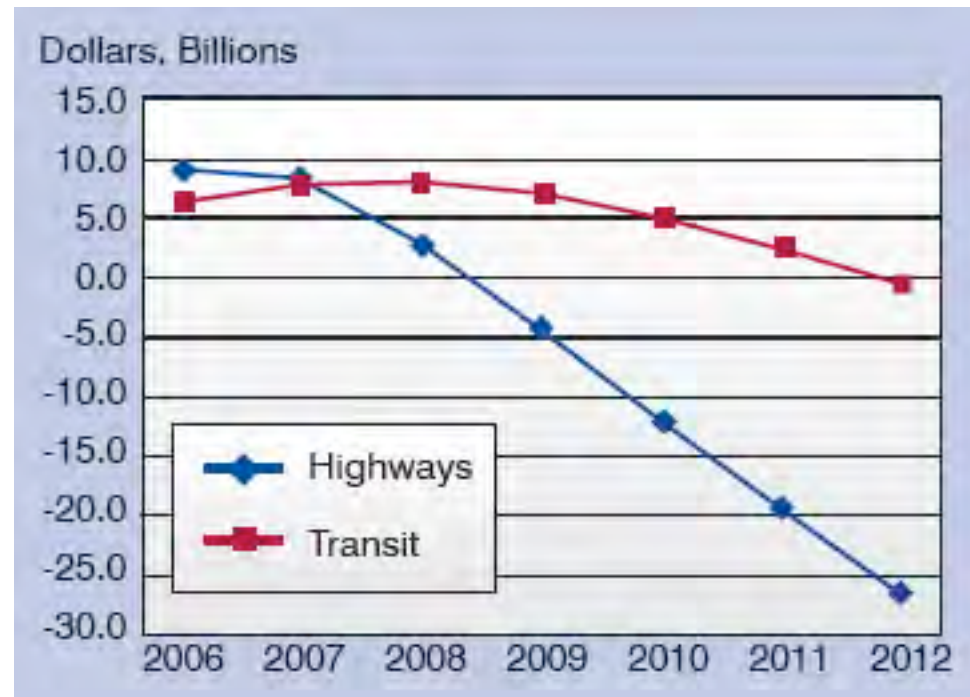
<sup>2</sup> The combined figures do not account for cross-modal impacts.

Source: National Surface Transportation Policy and Revenue Study Commission: Transportation for Tomorrow, December 2007, p. 6.

# Grant funding is declining

- The major source of funding for highway and transit transportation infrastructure, fuel taxes, is declining
- The Highway Account Balance (Trust Fund) is expected to be **in deficit** within the next year; transit by 2012

## Projections of Highway and Transit Account Balances Through 2012



Source: National Surface Transportation Policy and Revenue Study Commission: Transportation for Tomorrow, December 2007, p. 40.

# The bond market currently has challenges and needs new credit instruments

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- With municipal financial officials—including issuers, insurers, and rating agency analysts—appearing before the Congress, major financial institutions in dire need of liquidity, and the demise of some of Wall Street’s venerable transportation investment banking firms, it is clear that the \$2.6 trillion municipal market is in crisis
- Relying solely on capital markets and grant sources is insufficient and alternative sources of public and private equity funds must be considered—P3s, tax credit bonds, national infrastructure banks
- P3s are one necessary experiment to fix the problem

# P3s can serve as additional funding tools

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- In theory, P3s are based on an equitable transfer of risk and reward
- Global P3 experience has demonstrated **15% to 30%** life cycle cost savings
  - 75% that occur in the design build and
  - 25% in the operations phase of the life cycle of an infrastructure asset
- According to a Probitas Partners report, P3s represent between **10 and 15%** of all U.K. investments in public infrastructure

Source: "Investing in Infrastructure Funds" Probitas Partners, September, 2007, [probitaspartners.com](http://probitaspartners.com).

# P3s can serve as additional funding tools (cont'd)

- While there are several forms of P3s, our focus is on DBFO, DMFMO, BOO, since these serve as funding sources

Type	Description	Risk Transfer
<b>Design-Bid-Build (DBB)</b>	Design and construction contracts awarded separately to private sector engineering and contracting firms	
<b>Design-Build (DB)</b>	Combines the design and construction phases into one fixed-fee contract	
<b>Design-Build-Operate-Maintain (DBOM)</b> <b>Build-Operate-Transfer (BOT)</b>	Selected contractor is responsible for the design, construction, operation, and maintenance of the facility for a specified time	
<b>Design-Build-Finance-Operate (DBFO)</b> <b>Design-Build-Finance-Operate-Maintain (DBFMO)</b>	Similar to DBOM, but contractor is also responsible for all or a major part of the project's financing	
<b>Build-Own-Operate (BOO)</b>	The private partner owns the facility and is assigned all operating revenue risk and any surplus revenues for the life of the facility.	

# Understanding Private Equity

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# Financial investors (private equity) supplement strategic investors

	<b>STRATEGIC</b>	<b>FINANCIAL</b>
Characteristics	Firm that derives benefit from project beyond financial returns	Focused only on financial returns
Examples	Construction, A & E firms, equipment suppliers (e.g. transit vehicles)	Investment banks, pension funds, some investing through private equity infrastructure funds (PEIF)
Financial Capability	Varies: large firms have capability/funds; smaller ones have very little	Enormous new capacity, primarily through PEIFs; new <b>pension fund</b> focus
IRR Requirements	Market-based, yet consider returns from <b>related activities</b> , such as construction contracts	Market-based, reflecting risks and comparable options

# Although not new, private equity (PE) has come of age in the last decade

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- Private equity is the investment in companies that **do not trade** on a quoted market
- Source investors often include pension funds and insurance companies able to take the risk of **less-liquid, yet higher-yielding** “alternative investments” within their large, diversified portfolios
- For example, CalPERS and CalSTRS have the following target asset allocation for private equity:
  - CalSTRS: 8%
  - CalPERS: 6%

Source: [www.calstrs.com/Investments/Invport.asp](http://www.calstrs.com/Investments/Invport.asp)

Source: [www.calpers.ca.gov/index.jsp?bc=/investments/assets/equities/aim/programoverview.xml](http://www.calpers.ca.gov/index.jsp?bc=/investments/assets/equities/aim/programoverview.xml)

# Although not new, private equity (PE) has come of age in the last decade (cont'd)

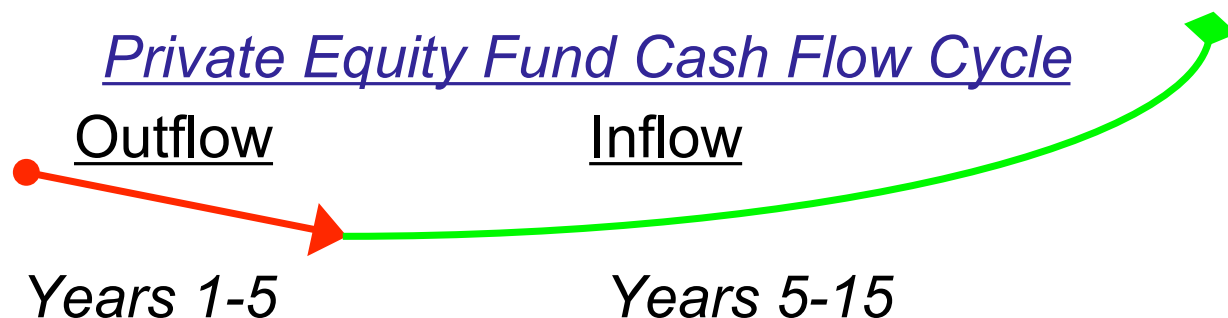
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- Capital is raised while the fund is “in market” from individual investor through financial advisors networks and distribution platforms as well as from institutional investors
- When a target fund size is achieved, the fund is closed to investors
- Virtually all private-equity funds are organized as limited partnerships, with private equity firms serving as the general partner (“manager”) of the fund
- Fund managers typically received a fixed “management” fee and a variable (carry)
- Distributions of adjusted net cash flows are made quarterly to investors

Source: Yasuda, Ayako and Metrick, Andrew, "The Economics of Private Equity Funds" (September 9, 2007). Swedish Institute for Financial Research Conference on The Economics of the Private Equity Market.

# Typical private equity funds have a 10-15 duration and “J-Curve” characteristics

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Source: IMG interviews with infrastructure funds; [www.calpers.ca.gov](http://www.calpers.ca.gov)

- Private equity funds expect to deploy capital in the first 5 years of inception and earn returns in **last 10 years**
- The “J-cure” is an added burden to achieving acceptable IRRs:
  - “The J-curve phenomenon is the effect of the cash-flow behavior of a partnership. It can be summarized as the first year's investment expenses of investing in a fund that has yet to harvest its capital gains in the future. This normally translates into a negative IRR in the early years of the fund. The plot of the partnership values over time generally resembles a letter J.”

Source: [www.calstrs.com/Investments/portfolio/privateEquity.aspx](http://www.calstrs.com/Investments/portfolio/privateEquity.aspx)

# Major institutions are now re-focusing their portfolios on infrastructure

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- Pension and insurance funds driven in several ways:
  - Very much interested in less-liquid, yet higher-yielding “alternative investments”
  - Hungry for long-dated, stable assets to match liabilities and to help with diversification
- Example: CalPERS established “inflation-linked asset class” consisting of up to \$2.5 B initially, as of September, 2007
  - Includes re-classifying \$573 million (M) from **private equity, real estate and fixed income** into new asset class
  - “CalPERS could become a major player in solving some pressing public policy problems related mainly to energy and transportation.”

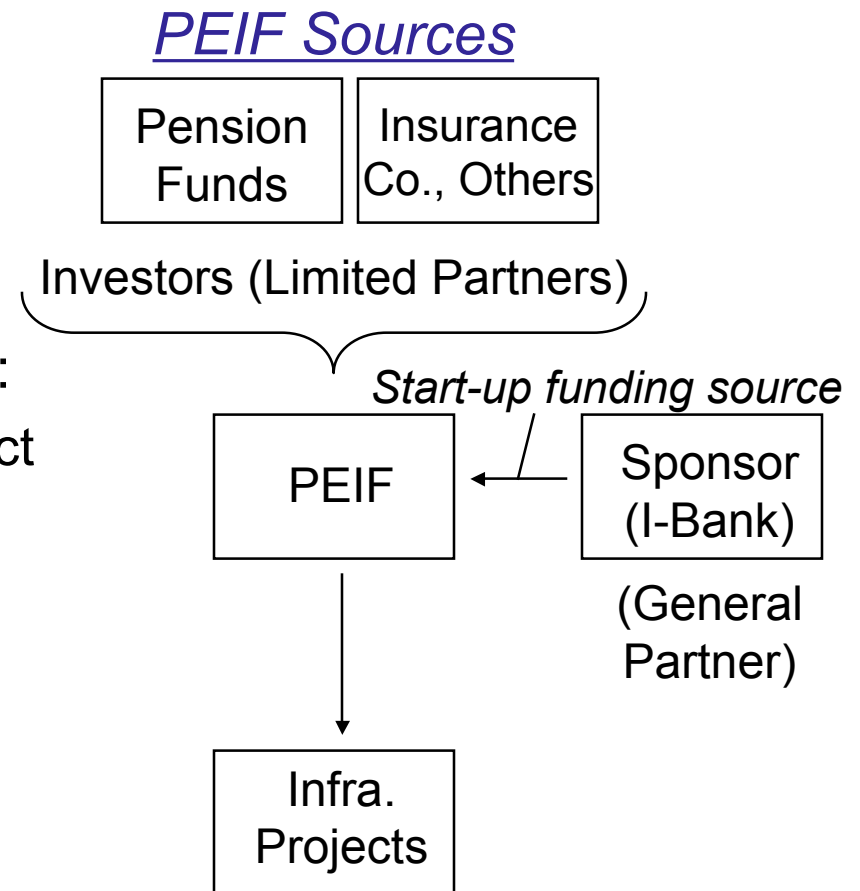
Source: [www.calpers.ca.gov/index.jsp?bc=/about/press/pr-2007/sept/infra-invest-prog.xml](http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-2007/sept/infra-invest-prog.xml)

- CalPERS initial minimum IRR goal is a net return that meets or exceeds the Consumer Price Index (CPI) + 500 basis points, or approximately 8%.

Source: [www.calpers.ca.gov/eip-docs/about/board-cal-agenda/agendas/invest/200709/item04b-00.pdf](http://www.calpers.ca.gov/eip-docs/about/board-cal-agenda/agendas/invest/200709/item04b-00.pdf)

# Driven by institutions, PEIFS have similar approaches as other PE funds

- Private equity infrastructure funds (PEIF) initially apply **same duration** approach as other PE funds, since they often originate from institutions that manage such funds
- Some know IRR must reflect risks:
  - A completed infrastructure project reflects has risks more similar to **real estate** than **start-up venture capital**, the two extremes of private equity
  - New and experienced PEIF investors have different return expectations, the latter with **lower expectations**



# World's 20 PEIFs have \$80 to 130 B under management; chart shows top 10

Fund Name	Parent	Amount (M) Raised/Target	Vintage Year/Status	Geographic Target
GS Infrastructure Partners I	Goldman Sachs	\$6,500	2006	Global
Macquarie European Infrastructure Fund II	Macquarie Bank	€4,600	2006	Europe
Macquarie Infrastructure Partners	Macquarie Bank	\$4,000	2007	North America
Alinda Capital Partners I	Alinda Capital Partners	\$3,000	2007	North America
AIG Highstar III	AIG Highstar	\$3,000	In Market	Global
Citigroup Infrastructure Investors	Citigroup Alternative Investments	\$3,000	In Market	Developed Markets
Morgan Stanley Infrastructure	Morgan Stanley	\$3,000	In Market	Global
RREEF Pan-European Infrastructure Fund	Deutsche-RREEF	€2,000	In Market	Europe
Abraaj Infrastructure and Growth Capital Fund	Abraaj Capital	\$2,000	In Market	Global
Babcock & Brown Infrastructure Fund	Babcock & Brown	\$2,000	In Market	North America

*The Risks and Rewards of  
Private Equity in Infrastructure*

Source: \$80 B estimate: "Investing in Infrastructure Funds" Probitas Partners, September, 2007; \$130 B estimate: Palter, Robert, Walder, Jay, and Westlake, Stian. "How investors can get more out of infrastructure." The McKinsey Quarterly" (February 2008) pg. 1.

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## Some PEIFs recognize that assets have different risk profiles

Investment Strategy	Asset Characteristics	Investment Duration	Expected IRR
Brownfield	Well-established cash-flowing assets, similar to A-1 commercial real estate	15 - 30 years	10 - 12%
Hybrid	Existing assets with cash flows that requires significant new investment	Combination of brownfield and greenfield	12 - 15%
Greenfield	Design, build and operating risk, similar to traditional private equity risks	4 - 5 years; then sold	15% +

Source: "Investing in Infrastructure Funds" Probitas Partners, September, 2007, probitaspartners.com and next page

# Yet, there is little PEIF consensus on duration

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<b>Funding Vehicle</b>	<b>Fund Duration</b>	<b>Challenge/Solutions</b>
Traditional PE structure	10 years	Appropriateness for assets of 15-30 years? Some funds offering 12-15 year duration
Hybrid	Mechanisms to transfer from affiliated shorter-term to longer funds	Transfers sometimes create conflict, especially over <b>pricing</b>
Evergreen	Allow investors right to exit after certain period	Similar pricing issues as with hybrids; goal is to sell to retail investors seeking bond-like returns

Source: "Investing in Infrastructure Funds" Probitas Partners, September, 2007, [probitaspartners.com](http://probitaspartners.com) and next page, and discussions of authors with private equity funds

## Non-statistically valid sample of PEIF prospectuses show 10-12 year duration focus

FUND	SIZE (M)	FUND TERM	EXPECTED GROSS IRR	FUND DISPOSITION
HSBC	\$500	10 yrs*	7-8%	Reorganize or sell to secondary fund
FUND 2	\$1,100	10 yrs	10%	Reorganize or sell to secondary fund
FUND 3	\$1,500	10 yrs*	12-14%	Reorganize or sell to secondary fund
FUND 4	\$3,000	10 yrs*	20%	Sell to secondary fund
FUND 5	\$1,000	12 yrs*	17-22%	Sell to secondary fund

\* Plus potential two one-year extensions

Source: PEIF prospectuses; except for HSBC fund, all of these prospectuses are not publicly available

# Part of the duration challenge lies with pension funds--CalPERS/CalSTRS examples

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- CalPERS has a ten-year philosophy in managing and measuring performance of much of its private equity portfolio:
  - “Because there is no instantaneous market to trade these investments, private equity is better suited for patient, long-term investors like CalPERS who are willing to wait 10 years or longer to maximize investment returns.”
  - “CalPERS invests in private companies primarily through Limited Partnerships, or funds. These investments are often structured as 10-year legal agreements with a professional investment manager.”  
Source: [www.calpers.ca.gov/index.jsp?bc=/investments/assets/equities/aim/programoverview.xml](http://www.calpers.ca.gov/index.jsp?bc=/investments/assets/equities/aim/programoverview.xml)
  - “The Long-term Benchmark shall be the 10-year rolling average for the total return of the CalPERS Wilshire 2500 Index plus a 300 basis point risk premium. The Long-term Benchmark is net of fees and expenses.”  
Source: [www.calpers.ca.gov/eip-docs/investments/policies/alternative/altern-invest-man-prog.pdf](http://www.calpers.ca.gov/eip-docs/investments/policies/alternative/altern-invest-man-prog.pdf) p. 3

# Part of the duration challenge lies with pension funds--CalPERS/CalSTRS examples (cont'd)

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- CalSTRS investment approach considers a 10 to 12 year investment period for private equity:
  - “The actual IRR performance of any limited partnership is not known until the final liquidation of the partnership, typically over 10 to 12 years. Until the liquidation takes place, the IRR is only an interim estimated return.”

Source: [www.calstrs.com/Investments/portfolio/privateEquity.aspx](http://www.calstrs.com/Investments/portfolio/privateEquity.aspx)

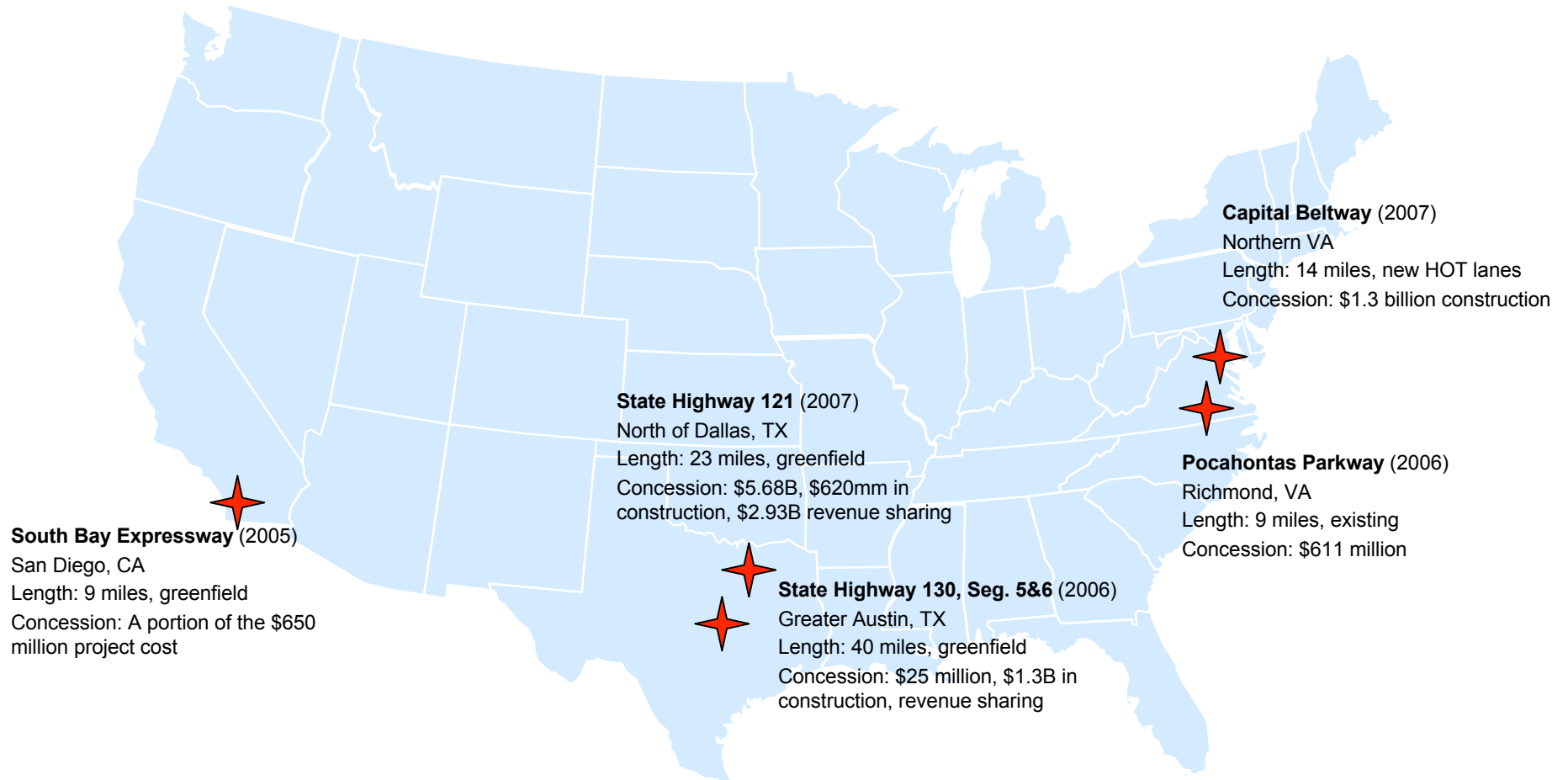


# Integrating Private Equity and Debt

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# Several recent examples demonstrate private equity's role in greenfield projects

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# PE's success has been based on obtaining inexpensive leverage

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- Leverage--financing with debt--is a major ingredient to successful PE financing, especially in the last five years, of relatively low interest rates
- In general, PEIF have the following options in funding a project or acquisition:

- Commercial bank financing, often through European banks, including Chicago Skyway and Indiana Toll Road Transactions:

<i>Commercial Loan</i>	<i>Long-term debt: loan, bond (PABs), private placement, TIFIA</i>
Construction Period	Operations Period

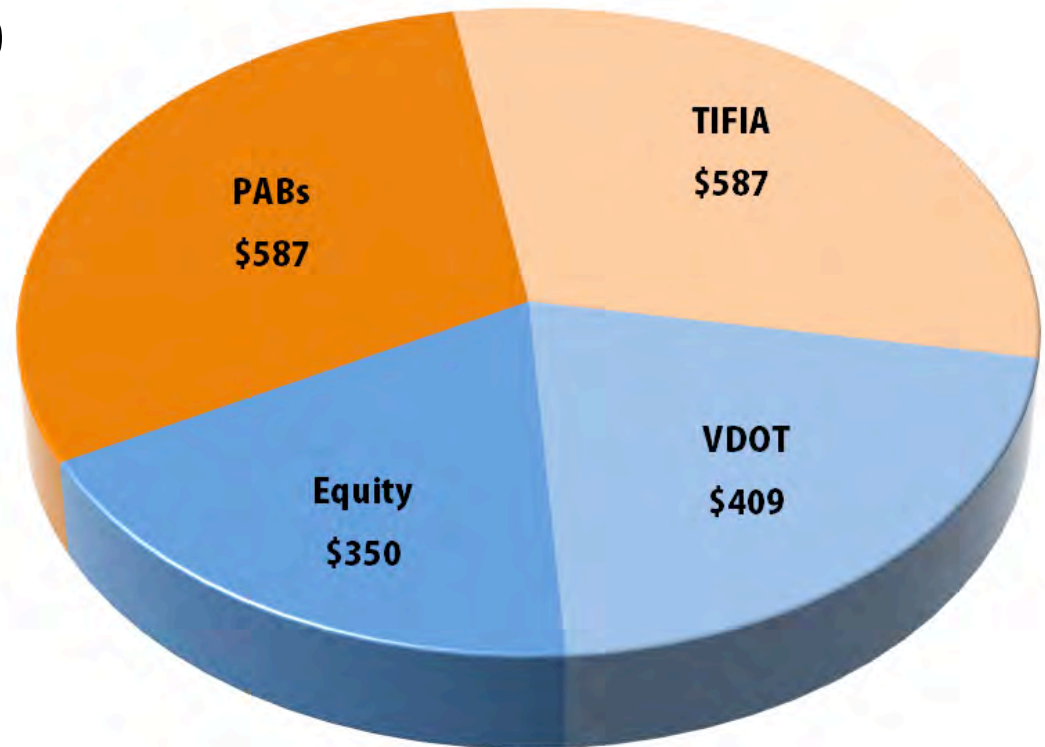
- Capital markets financing, often using innovative finance, including South Bay Expressway, Pocahontas Parkway:

<i>Long-term debt: bond (PABs), private placement, TIFIA</i>	
Construction Period	Operations Period

# Private equity makes a great combination With PABs and TIFIA

## Capital Beltway Funding Sources (\$ M), Dec. 2007

- Private Activity Bonds: benchmark of 3.6% for 20 years + margin of 1.75% for 7 years (5.35%); total 40 years
- TIFIA: 4.45%, 40 years, < than 25% of interest paid can cause default
- PABs & TIFIA: no principal repayment, first 25 years



Source: "Capital Beltway," Investor Briefing, Transurban, December 21, 2007,  
[www.transurban.com.au/transurban\\_online/tu\\_nav\\_black.nsf/alltitle/investors-presentations-2007?open](http://www.transurban.com.au/transurban_online/tu_nav_black.nsf/alltitle/investors-presentations-2007?open)

# Private equity makes a great combination With PABs and TIFIA (cont'd)

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- PABs provide long-term permanent capital at **tax-exempt rates** to private users repayment back-loading not an option:
  - This is because since 95% of the proceeds must be spent within 5 years on capital costs zero coupon and deep discount bonds are in effect, not allowed (95/5 rule).
- TIFIA's flexible repayment dovetails well when subordinate to PABs, providing low cost of capital, **flexibility on amortization**
- Combination provides early window for project construction risk, ramp up risk, and early equity returns
- Classic debt vs. equity challenge:
  - How to balance project debt repayment and returns to equity?
  - How should the cash flow be divided, especially if substantial amounts of senior and subordinate debt are **outstanding** when equity is fully paid, given equity's return targets

# Overcoming Private Equity's Challenges

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# Under 10-year PEIF repayment, dividends start flowing when operations begin

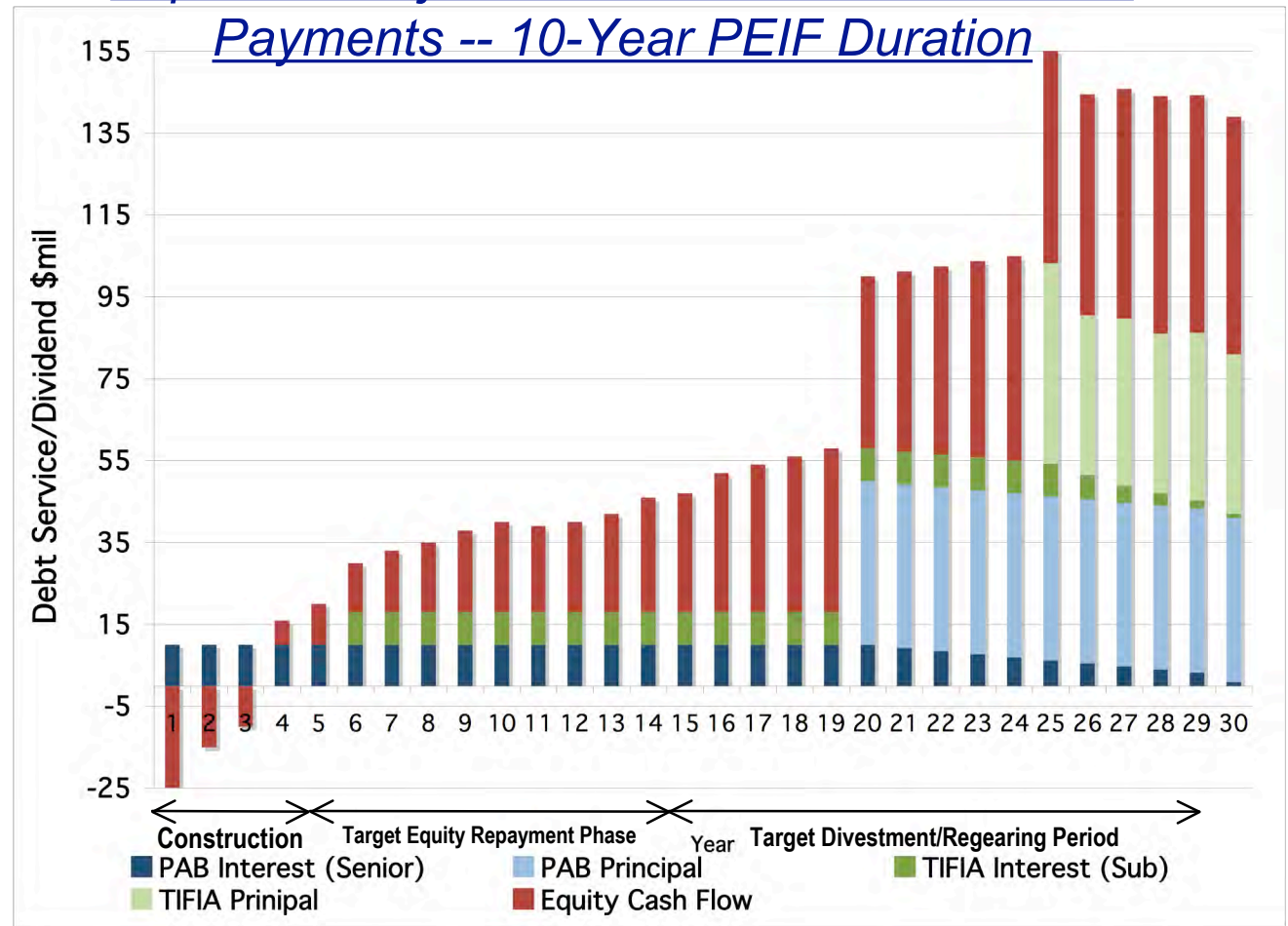
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- Typical large greenfield projects (over \$500+ M), have 3+ year construction periods, during which equity is drawn down
- To meet IRR requirements, dividends must begin during **cash-scarce** start-up period
- The next three slides show three different equity duration periods--10, 20 and 30 years--on a hypothetical infrastructure funding with the following capital source assumptions:
  - PABs: \$200 M
  - TIFIA: \$200 M
  - Equity: \$70 M
- Slides compare **balance** of equity and debt cash flows

# Under 10-year PEIF repayment, dividends start flowing when operations begin (cont'd)

- Early cash flows are substantial, so target IRR of 13% is achieved within 10 years
- 30-year IRR is 24%
- Principal is neither paid for senior (PABs), nor junior (TIFIA) debt during this 10-year period

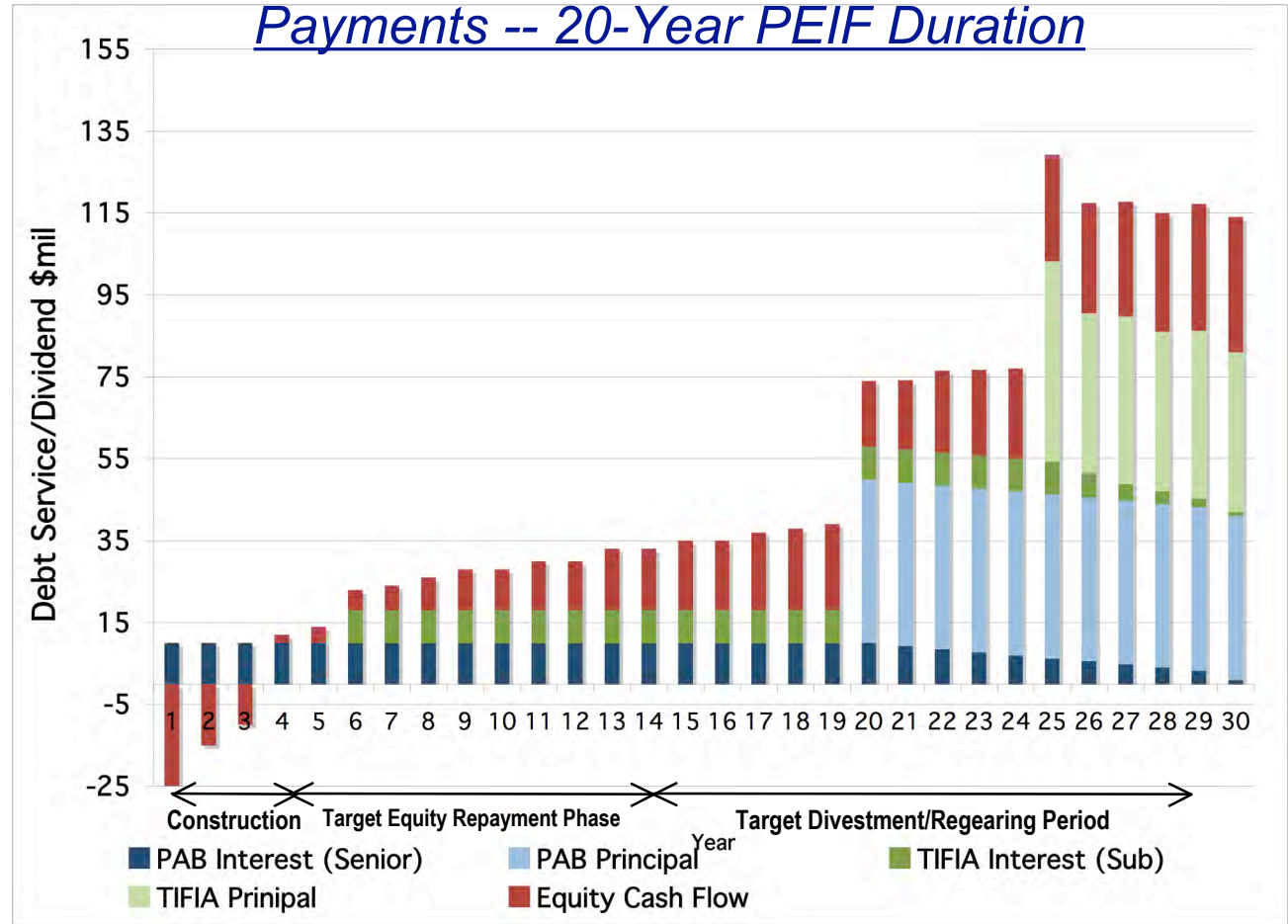
Expected Project Debt Service and Dividend Payments -- 10-Year PEIF Duration



# Under 20-year PEIF repayment, early dividends are much lower

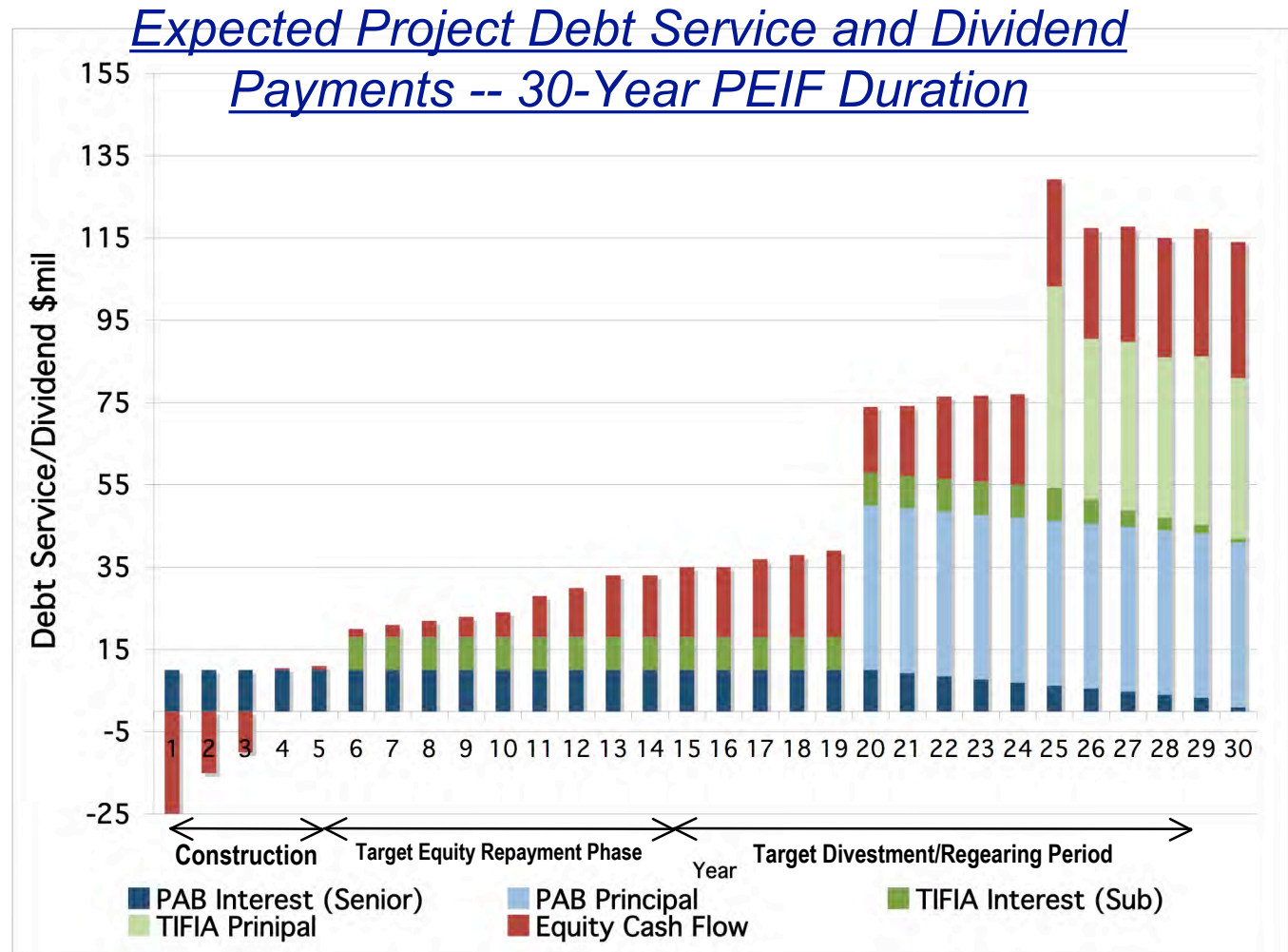
- Early cash flows are low, but grow rapidly in later years, so 13% IRR target is achieved within 20 years
- 30-year IRR is 16%
- Dividend payments are 2-3 times lower than 10-year scenario in first 7 years of operations

Expected Project Debt Service and Dividend Payments -- 20-Year PEIF Duration



# Under 30-year PEIF repayment, equity and debt repayment are more balanced early on

- Early cash flows are low and grow slowly, so target IRR of 13% is achieved after 30 years
- Dividend payments are 1.6 - 4 times lower than 20-year scenario in first 7 years of operations



# Duration issues raise issues about PEIF's fit with infrastructure and policy issues

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- Many projects, especially start-up toll roads, have prolonged ramp-up periods of **3 to 5 years**
- Bank loans, bonds, and innovative finance support may allow interest-only, capitalized interest, or reduced interest payments during this period
- Separate from ramp-up, general economic market cycles that have historically lasted up to five years, may **temporarily hinder expected demand**
- Public perception that private parties are taking advantage of public, by “**taking out their money**” after construction

# Duration issues can be overcome so long as all parties understand PEIF's fit

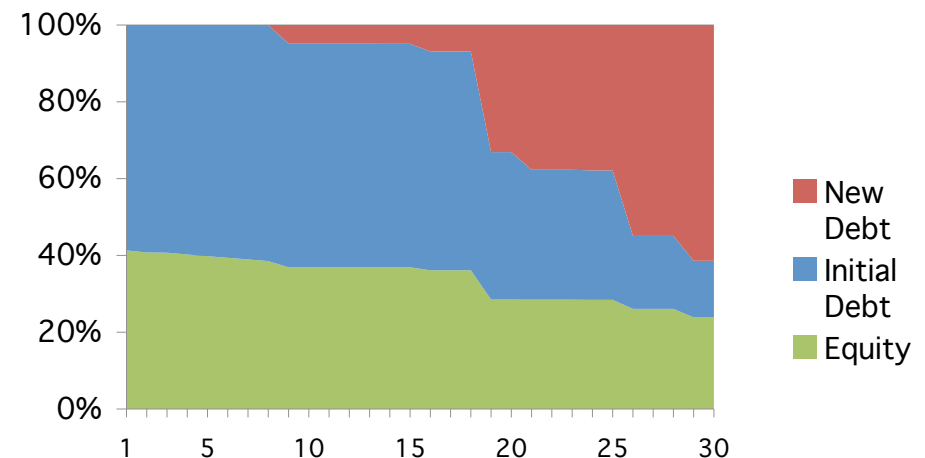
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- In general, however, commercial banks don't begrudge dividends as long as **agreed upon** debt schedules are paid--yet what is "agreed upon?"
- As with early dividends, in theory, repayment within 10-15 years should be to everyone's liking
  - Project is a success
  - Debt providers are being paid as scheduled
- However, commercial banks or innovative finance providers may be forced to accept greater-than-usual debt repayment **leniency** during early years, thereby increasing leverage and their risk
- This also applies pressure to **re-gearing issue** (following)

# Re-gearing should be allowed, under certain conditions

- Re-gearing consists of increasing the amount of debt in a project/entity, based on more stable or higher cash flows
- Through re-gearing, investors can **take out equity** from the project through extraordinary dividends or other payments
- Governments need to prepare for re-gearing:
  - Documentation should make process transparent
  - In general, project should benefit, i.e. reduced interest rates, partial refunding of innovative finance support, sharing of re-gearing proceeds

Re-Gearing Impact on Typical P3 Finance Structure



# Novation for the original investor should be user-friendly

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- Novation--being able to substitute a new contract with a new investor for the existing one--is a key challenge in P3s, where governments often require approval for change in ownership
- Given PEIF's challenges with duration, it is expected that the secondary market for PEIF (and all PE) transactions will grow, especially since not all infrastructure project lend themselves to IPOs, one of traditional "next steps" for PE-funded entities<sup>1</sup>
- In their P3 contracts, governments need to:
  - Draft clear novation terms
  - Establish performance-based measures to maintain O&M quality, with clear enforcement terms

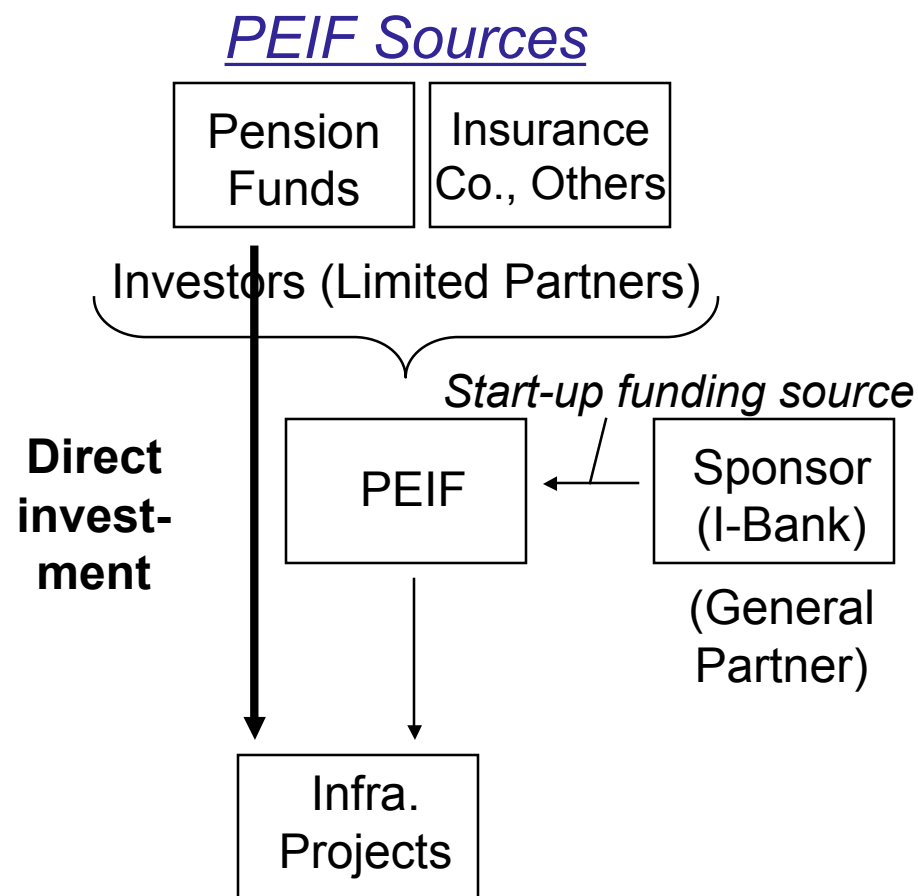
<sup>1</sup>Source: "The Secondary Market in Private Perspective" Jamaila Patel, December 2007, Deutsche Bank RREEF Research, [www.rreef.com/GLO\\_en/bin/Secondary\\_PE\\_Market\\_in\\_Perspective\\_12-07.pdf](http://www.rreef.com/GLO_en/bin/Secondary_PE_Market_in_Perspective_12-07.pdf)

# Conclusions

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# Private equity can serve as a funding source, under certain conditions

- If project fits into narrower time horizon of funds, and/or debt and sub-debt lenders, especially innovative finance providers, are understanding
- Documentation allowing re-gearing and novation is satisfactory to public and private parties
- Some private equity providers will need to accept longer duration and/or project should be funded **directly** from pension funds and other institutions



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