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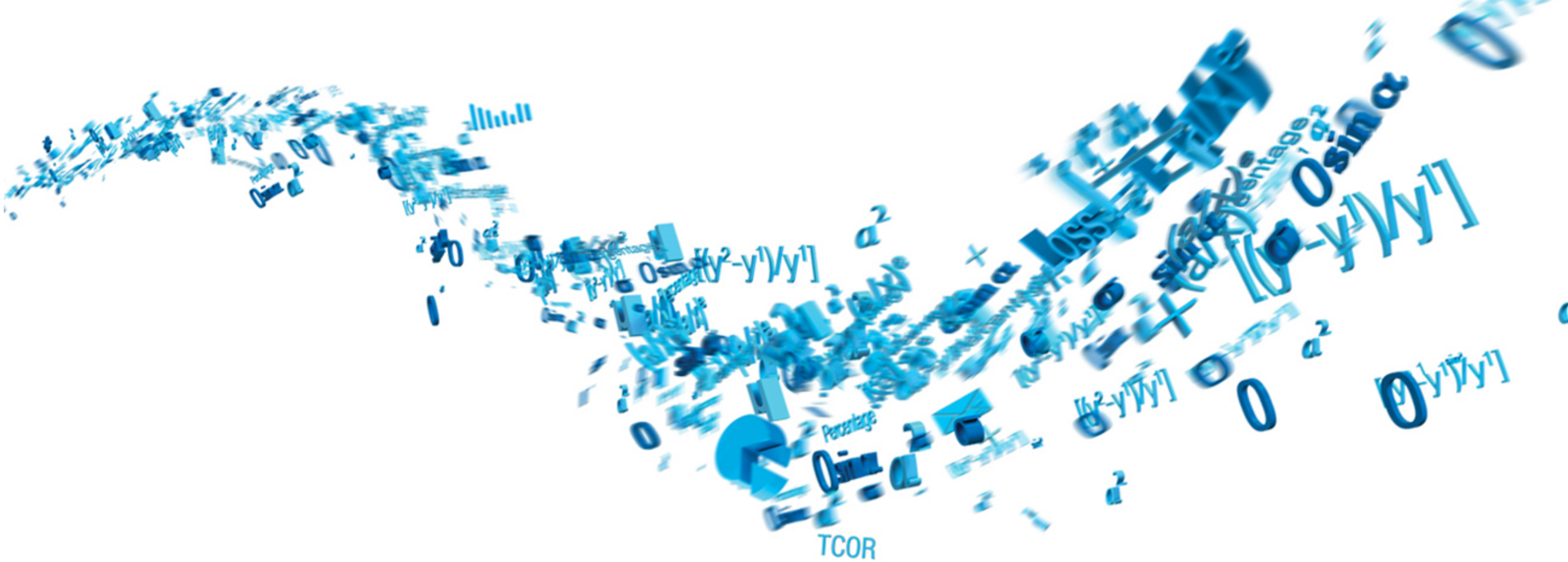

Infrastructure Education and Portfolio Build-out
Toronto Investment Board

May 2018

Aon Hewitt
Retirement and Investment

Empower Results®

Content

Section 1:

Introduction to Infrastructure as an Asset Class

What is Infrastructure?

- Long-life, hard assets serving the backbone of the provision of services in the global ecosystem
- Location-specific assets, facilities and structures that are essential to functioning societies and economies
- Strong market position, usually natural monopolies, with high barriers to entry and low elasticity of demand
- Sustainable, long term cash flows, underpinned by regulations or long-term contractual framework
- Potential for inflation protected revenues
- Low correlation to traditional asset classes
- Examples are electricity distribution networks, airports, roads, rail network, water and waste water, etc.

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Infrastructure by Characteristics

Essential services

- Daily usage, high volume
- Large customer base – households, businesses, passengers, drivers
- Low risk of technological obsolescence
- Community focus
- User demand for their output is less responsive to the broader business environment

High barriers to entry

- Long life, high value physical assets
- Significant capital requirements for competitor development
- Long term contracts/ concessions
- Often a natural monopoly
- Planning and approval requirements

Predictable cashflows

- Concession arrangements
- Long term contracts
- Captive market
- Pricing power, inelastic demand
- Generally low on-going capex
- Low operating costs
- Prices and revenues often set by regulation and not purely on market basis
- Operating track record and history

Inflation linkage / low correlation

- Cash flows typically exhibit strong inflation link due to regulation or contracts
- Low correlation with traditional asset classes provides diversification benefits

Infrastructure by Sectors

Economic Infrastructure

Transportation

- Toll roads, Bridges and Tunnels
- Airports
- Sea Ports
- Rail networks

Communications

- Cable networks
- Communication towers
- Select satellite systems

Energy and Utilities

Utilities

- Regulated gas & electricity assets
- Transmission and distribution networks
- Water distribution and treatment

Mid-Stream Energy

- Oil and gas pipelines,
- Gathering systems
- Storage

Power

- Renewable power
- Conventional power projects

Social Infrastructure

Social infrastructure

- Education facilities
- Healthcare facilities
- Public transportation
- Courts, police stations and prisons

Digging Deeper – Social / PPP vs. Economic Infrastructure

Social / PPP Infrastructure

- Social projects e.g. schools, hospitals, public transportation and government accommodation
- 25 year plus government backed concession arrangements
- Payments usually made on an availability basis
- Often explicit inflation linkage
- Net returns of 6-8% p.a. depending on entry point
- Return is generated entirely by income, no terminal capital value
- Political risk
- Typical 90/10 debt/equity split
- Fairly limited opportunity for active management
- Small universe of managers

Income / Liability Matching Characteristics

Economic Infrastructure

- Transportation, energy & utilities and communication sectors
- Can be held in perpetuity (although manager will normally look to exit after 10 – 15 years)
- Regulated, contracted or patronage based revenue streams
- Some inflation linkage but may not be explicit
- Net returns of 8-12%+ p.a. depending on strategy
- Capital appreciation as well as income generation
- Usage and regulatory risks
- Typical 50/50 debt/equity split
- Strong potential for active management to add value
- More managers but still concentrated universe of credible managers

Balanced

Income and Growth Focused

Infrastructure by Project Stage

Brownfield / Operational

- Investments into already existing and operating infrastructure assets that are of lower risk than construction projects
- Regulations, long-term contractual framework, or off-take agreements in place that provide predictable cash flow stream
- Investors at the construction stage often look to recycle their capital to loner-term brownfield investors upon construction completion
- Often significant operating history exists that allow investors to take a more informed view of, for example, traffic history, passenger volume, etc.
- Returns can range between 6-12% depending on the type of infrastructure and its risk profile

Greenfield / Construction

- Investment in infrastructure at construction stage
- Greenfield investments can be higher risk due to:
  - Identifying consortium partners (e.g. builder, operations and maintenance contractor)
  - Managing planning and permit consents etc.
  - Construction risk – completing on time / within budget
  - Forecasting user demand risk – e.g. traffic
- Contractual framework or off-take agreements may and may not be in place
- A Greenfield premium of 3% to 5% can be achieved to compensate for these additional risks

Risk

Infrastructure by Revenue Models

	Availability Based Payments made usually by government authority for maintaining the assets for use	**Regulated / Contracted** Revenues are generated from users under a regulatory or contractual framework	**Contracted** Long-term contractual framework but at increased volume and / or price risk	**Demand Based / Market** Revenues are generated from users with no long-term contracts in place
Revenue Source	• Availability based payment usually from a government authority / agency	• End users / Usage based payments / revenues	• End users / Usage based payments / revenues	• End users / Usage based payments / revenues
Incremental Risks	• Operating costs • Delivery (service performance) • Political	+ Regulatory risk + Volume risk (generally low) + Social & Environmental	+ Volume risk (e.g. traffic) + Some pricing risk (generally low) + Active asset management	+ Competitive and pricing risks + Volume risk (higher) + Commodity risks
Examples	• Most social infrastructure • Hospitals, schools, government accommodation, sports stadium • Availability based transport	▪ Energy distribution and transmission ▪ Pipelines (with contracted price and volume) ▪ Water, waste water	▪ Toll roads, tunnels, bridges ▪ Rail ▪ Airports, Seaports ▪ Pipelines (with volume risk)	▪ Merchant power (no off-take) ▪ Service stations ▪ Car parks ▪ Waste / waste to energy
Expected Returns	• 6-8% total returns of which 4-5% cash yield	• 6-8% total returns of which 4-5% cash yield	• 8-12% total returns of which 4-6% cash yield	• 12%+ total returns of which 4-6% cash yield

Risk

Infrastructure by Strategies

Core Infrastructure

- Comprised predominantly of mature operating infrastructure businesses (and may include some greenfield also)
- Usually long term contracted, regulated with low volume risk, and availability based assets
- Maintenance strategy or large management teams in place for operationally intensive assets
- Energy distribution, contracted pipelines, water and waste water, hospitals, government facilities, etc.
- Returns are predominantly comprised of predictable / stable cash yield

Core+ / Value Add Infrastructure

- Still infrastructure but growth and / or inefficient mature operating infrastructure businesses
- Focus on operational improvements, contractual improvement, growth, corporate governance, de-risking, etc.
- Buy-and-aggregate also exist (small and mid-market)
- Toll Roads, Airports, Sea Ports, pipelines (with some volume risk), core assets with inefficiencies or growth opportunities
- Cash yield is still strong but there is usually an equal or higher amount of capital appreciation due to growth, restructuring and active management

Section 2:
Infrastructure Program Considerations

Recap - Introduction to Infrastructure as an Asset Class

Key Characteristics

- Essential services
- High barriers to entry
- Predictable cash flows
- Inflation hedge
- Low correlation with traditional asset classes
- Lower risk and lower volatility

Stages / Strategies

Revenue Models

- Availability Based
- Contracted
- Regulated
- Merchant

Stages / Strategies

Stages

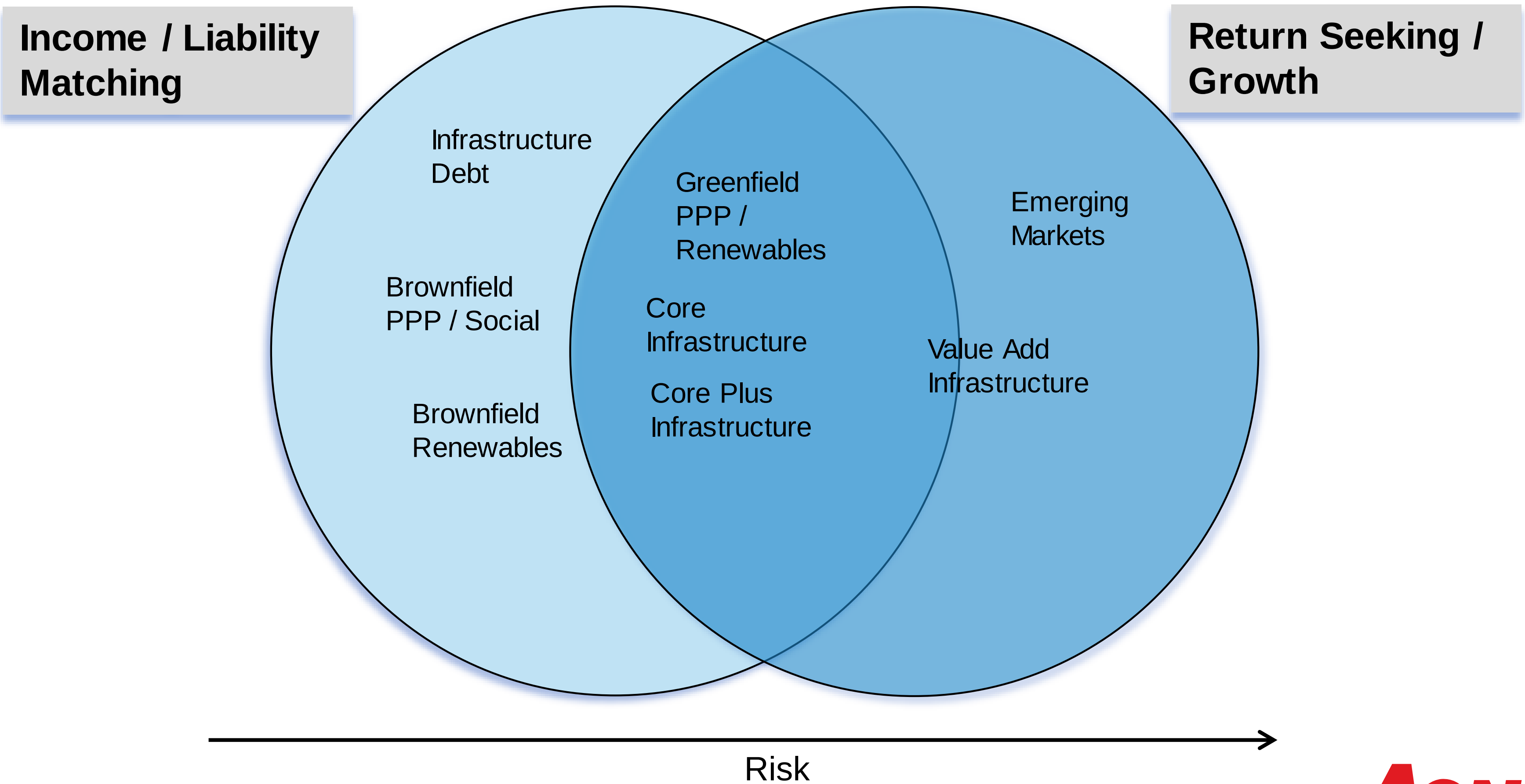
- Brownfield – Operating
- Greenfield - Construction

Strategies

- Core – Maintenance or Less Active Management
- Core Plus or Value Add – Active Management

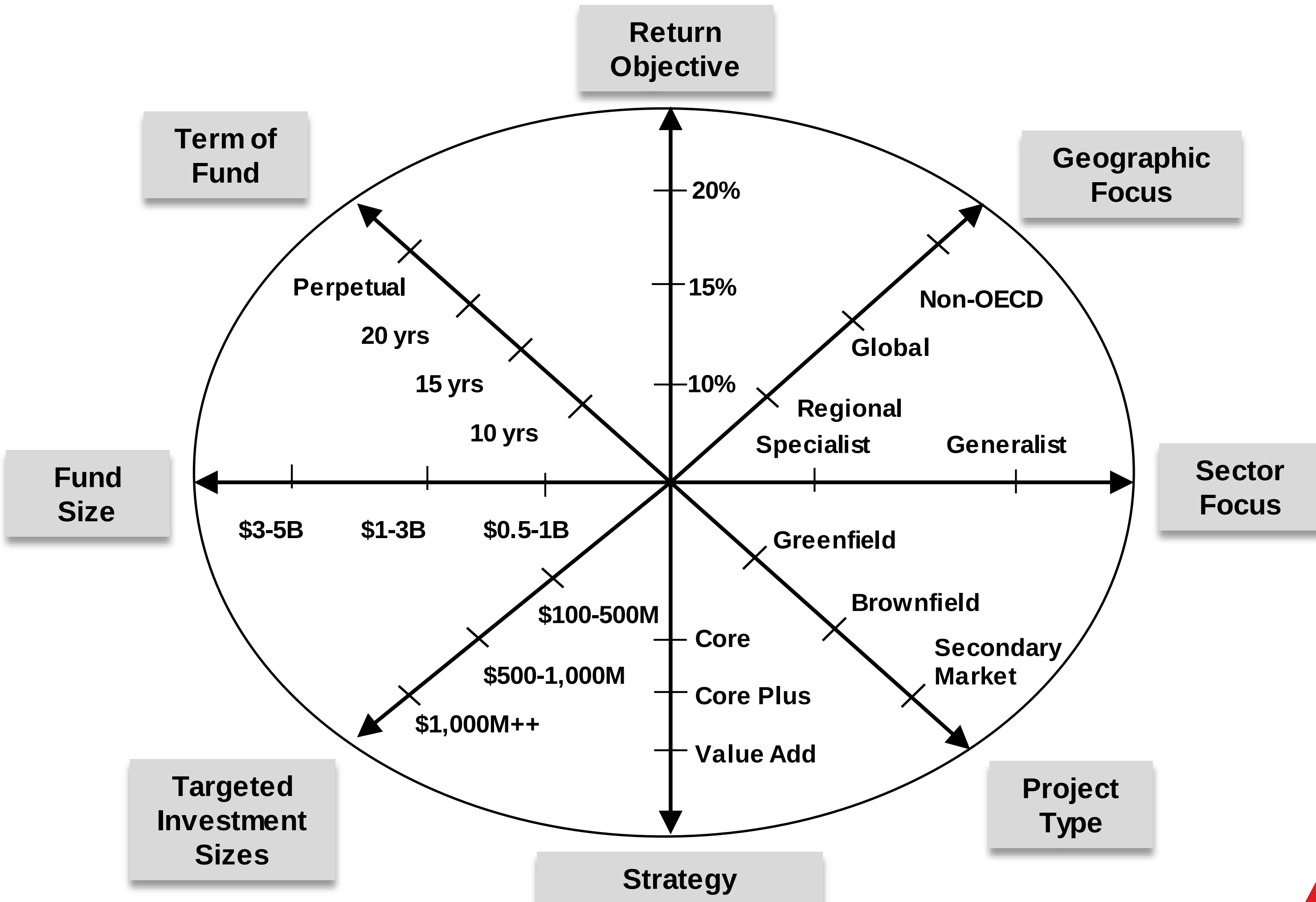
Role of Infrastructure in a Portfolio

- Infrastructure is a diverse asset class and can have a variety of roles within a portfolio. The key roles are a growth seeking tool or liability matching tool.



Diversification Considerations

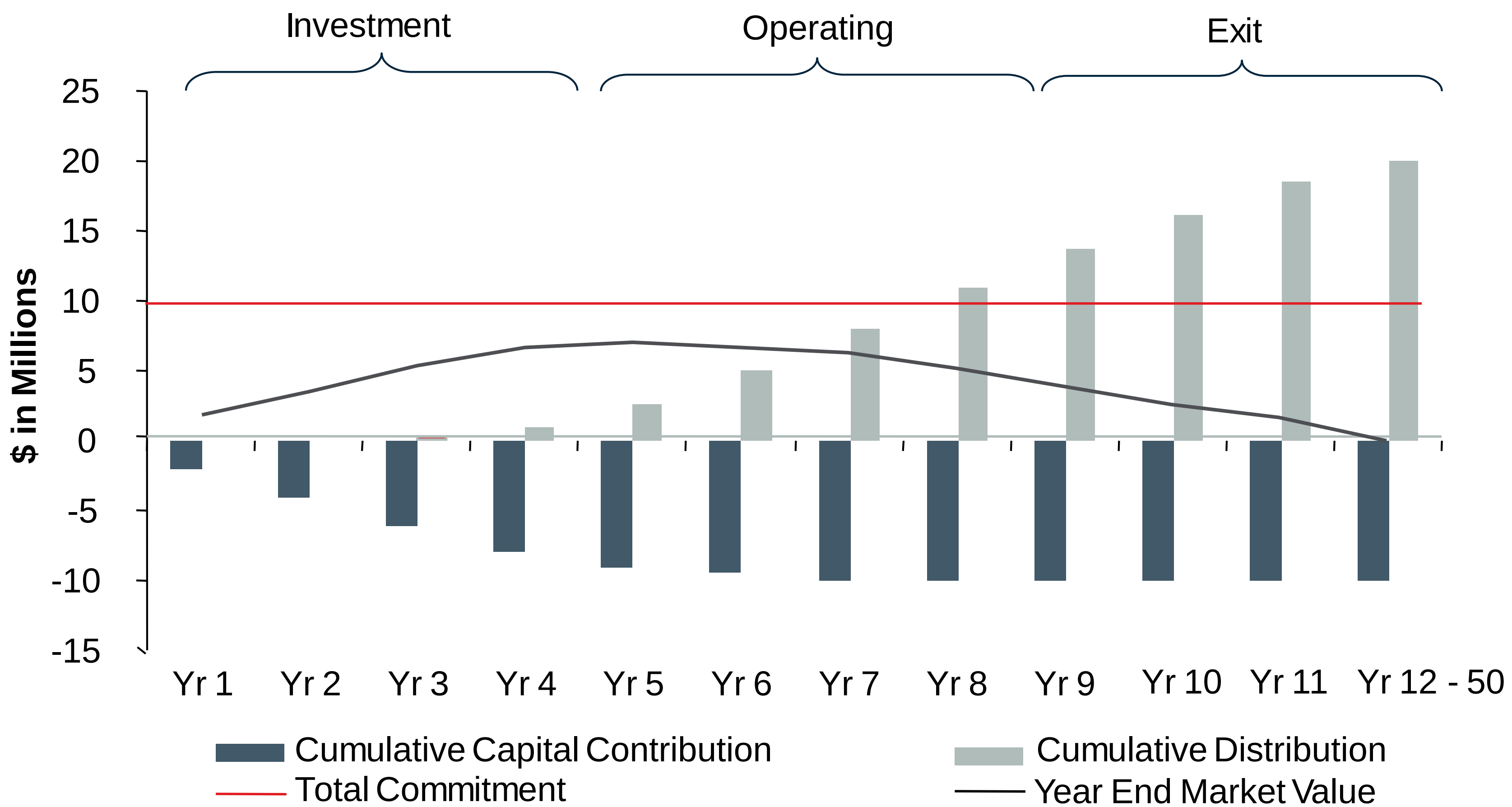
Broad array of infrastructure investment strategies



Typical Terms and Structure

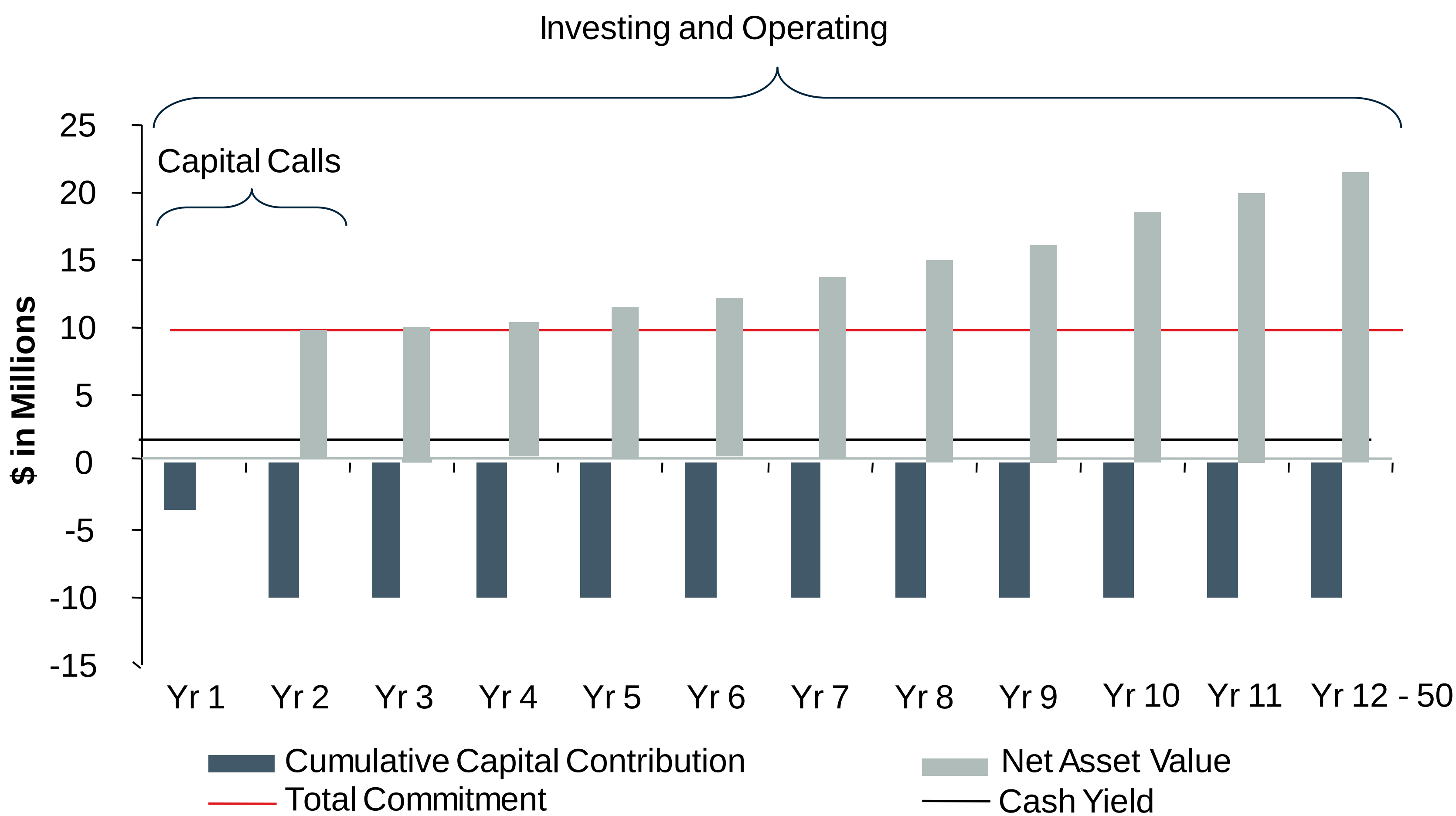
Typical Terms	Infrastructure
Structure	▪ Closed-end ▪ Open-ended
Term / Liquidity	▪ Fund term 12 - 25 years for closed-end funds, depending on strategy ▪ Evergreen for open-ended funds with quarterly to semi annual liquidity (lock-up may exists)
Fees	▪ Closed-End: 1.5% management fee and 20% carried interest over a specified hurdle rate (usually 8%) ▪ Open-Ended: 0.8% to 1.2% management fee and 10-20% carried interest over a specified hurdle rate (usually 8%)
Cash Flows	▪ Closed-End: Drawdown over first 5 years, Distributions from year 5 to 12 ▪ Open-Ended: Drawdown with in 6 to 24 months, Distributions post drawdown
Leverage	▪ 40-80% depending on strategy
Expected Returns (net of fees)	▪ Core: 6% - 8% ▪ Core-Plus/Value-added: 8% - 12% ▪ Opportunistic: +12%

Cash Flow Profile: Closed-End Funds



The benefits of investing in infrastructure are realized over the long term and it requires a long term strategic commitment by investors

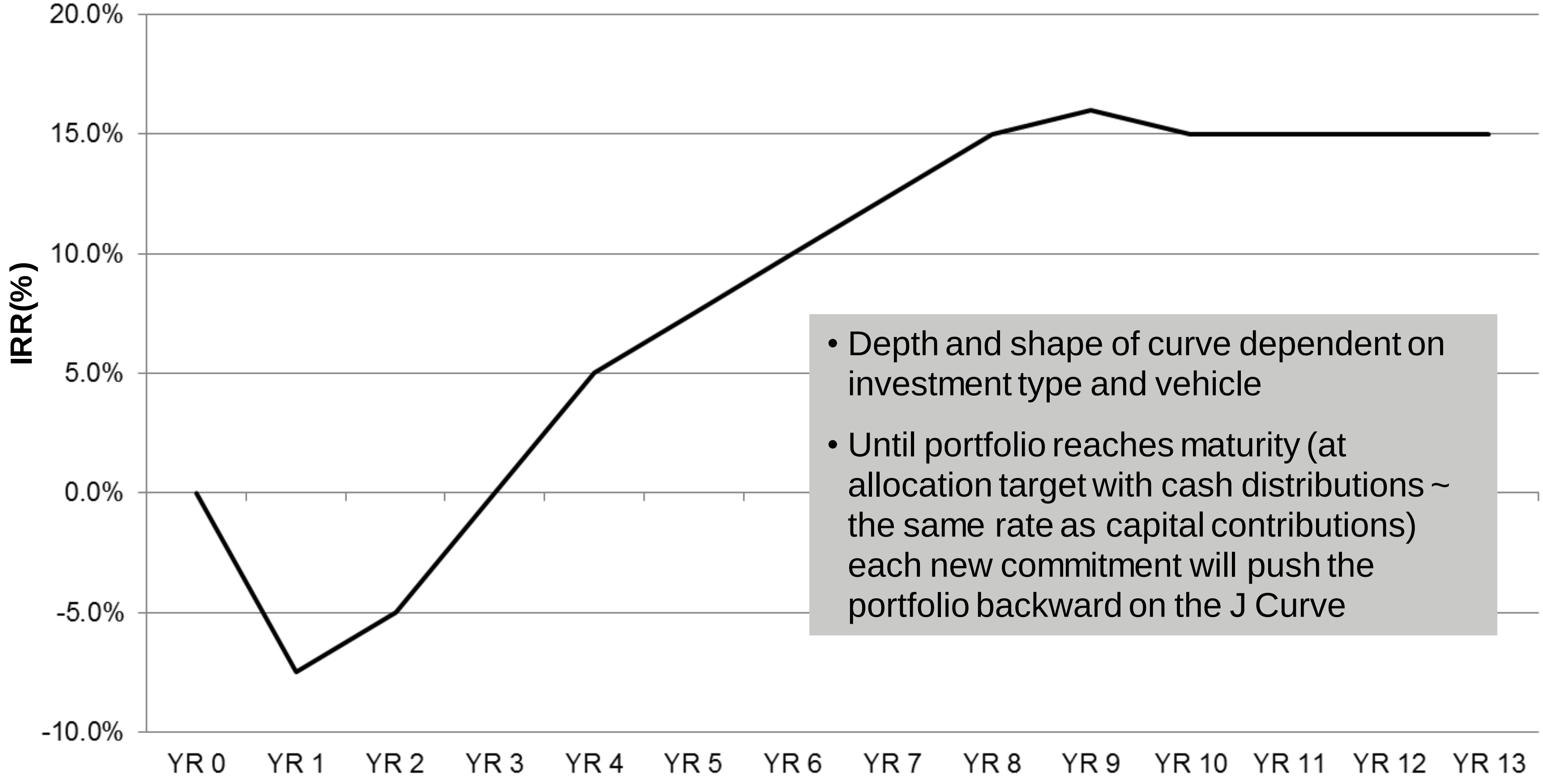
Cash Flow Profile: Open-Ended Funds



Open-ended funds usually follow buy and hold approach and do not frequently sell investments. NAV grows over time . . .

Return Profile - J Curve

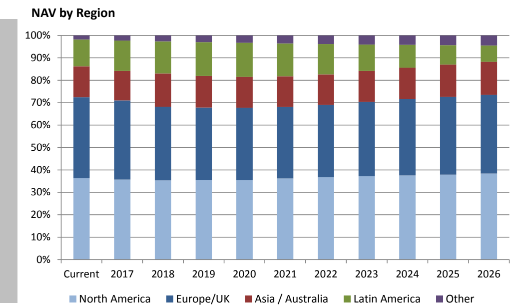
The curve created by plotting the returns generated through an infrastructure fund against time (from inception to termination)



- Depth and shape of curve dependent on investment type and vehicle
- Until portfolio reaches maturity (at allocation target with cash distributions ~ the same rate as capital contributions) each new commitment will push the portfolio backward on the J Curve

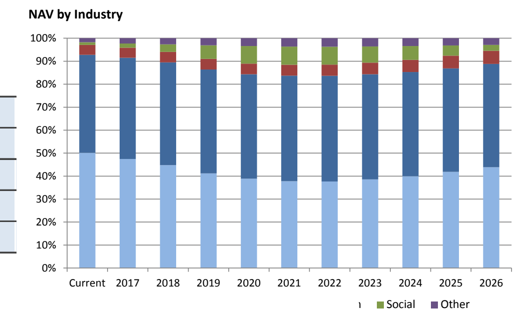
Program Management Cycle

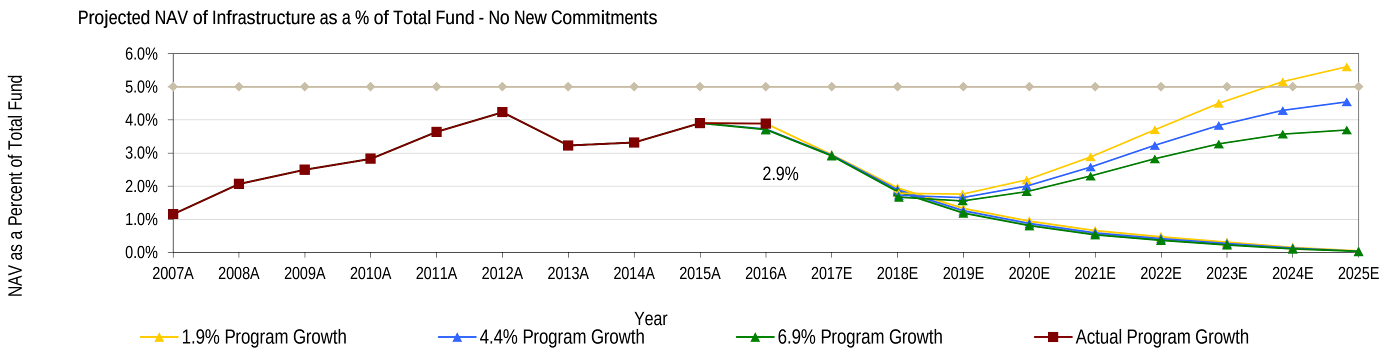
- Determine / educate on role and objectives of Infrastructure allocation
- Program and portfolio review
- Determine appropriate structures and type of investments
- Conduct pacing analysis to determine annual commitment schedule
- Investment / manager selection
  Portfolio monitoring and management



Annual Commitment Pace
In $ Millions

Year	FoF / Secondary	Primary	Co-Invest	Total
2018	50.0	60.0	0.0	110.0
2019	0.0	0.0	20.0	20.0
2020	30.0	30.0	20.0	80.0
2021	0.0	0.0	20.0	20.0
2022	20.0	20.0	20.0	60.0
Total	**100.0**	**110.0**	**80.0**	**290.0**





Proprietary pacing model utilizes cash flow characteristics of targeted funds to develop long term plan

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Section 3:
Accessing Infrastructure

Direct Investments in Infrastructure

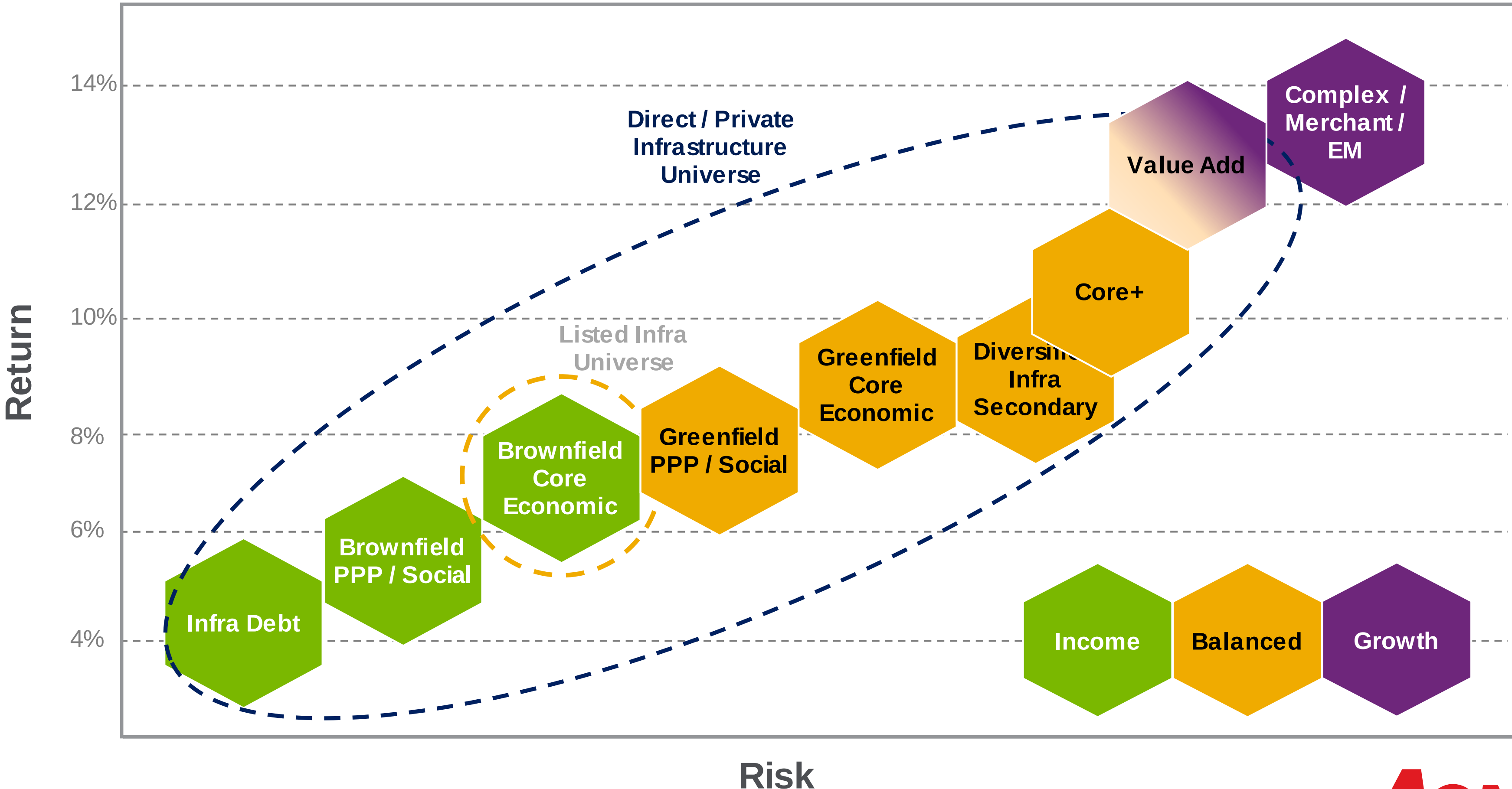
Approach	Suitable Investment Characteristics	Suitable Segments
Direct Investing	▪ Mainly core infrastructure assets ▪ Maintenance assets with low operational intensity involved in the business or large management teams in place for operationally intensive assets ▪ Provides the ability to continue holding the exposure in the portfolio	▪ Long term fully contracted, regulated and availability based infrastructure ▪ Roads, gas / electricity and water utilities, social, renewable energy and some communication assets
Co-Investing	▪ Core and core plus / value add assets ▪ Relatively smaller and mid-market assets that may and may not have full management teams in place ▪ Operationally intensive assets that require investor's expertise for active management ▪ Usually comes with tag-along and drag-along features and may diminish the ability to continue holding the exposure	▪ Also long-term fully and partially contracted assets, regulated assets with price / volume risk ▪ Ports and logistics and some road assets, power and some mid-stream energy assets ▪ Operational improvements, growth, greenfield assets

Investing in Direct Infrastructure Funds

Vehicle	Benefits	Concerns
Closed-end Primary Fund Closed end, limited partnership structure that creates a portfolio of investments in private companies - 10 to 15 years fund term - 4 to 6 years investment period - 1.5% average management fee - 20% carry over 8% hurdle rate	▪ One level of fees ▪ Ability to make tactical allocations ▪ Better control of timing and amounts of capital deployment ▪ Allocations can be tailored directly to overall plan's risk appetite ▪ Largest opportunity set for investors	▪ Requires large number of funds to manage concentration risk; ▪ Takes 4 to 5 years to get invested ▪ Limited life funds must exit investments in 10-12 years, requires re-deployment to newer funds ▪ Significant disparity in performance, manager selection is key and could be time and resource consuming
Closed-end Secondary Funds Closed end, limited partnership structure that acquires LP interests in other primary funds and may also make co-investments - Usually 0.75-1% management fee and 5-10% carried interest over 6-8% hurdle	▪ Much higher level of diversification ▪ Faster deployment and distribution ▪ Help mitigate portfolio J-curve ▪ Administratively efficient ▪ May provide access to specific regions or niche strategies ▪ Back fills vintage year exposure	▪ Two levels of fees ▪ Returns impacted by secondary market conditions ▪ No customization ▪ Not many funds in the market ▪ Universe is very small for infrastructure
Open-end Funds Open-end, limited partnership structure that usually creates a portfolio of investments in private companies with control and minority positions. - 0.75% -1.25% management fee - 10-20% performance fee over 6-8% preferred return - Usually quarterly redemptions	▪ Fund units are redeemable at NAV (usually quarterly) that provide liquidity ▪ Significant portfolio visibility ▪ May provide access to specific regions or niche strategies ▪ Can accelerate time to reach allocation ▪ May provide vintage year diversification as the fund may continue to invest ▪ Ability to continue holding exposure for a longer term	▪ Limited number of fund managers ▪ May have long subscription queues ▪ No control of timing or amount of capital deployment ▪ No customization ▪ Usually have lock-up periods ▪ May have redemption gates restricting liquidity

Understanding Infrastructure Universe

- Infrastructure is a diverse asset class and can have a variety of roles within a portfolio ranging from mainly income to growth . . .
- Listed Infrastructure provides access to a small segment of infrastructure universe . . .



Opportunities Landscape – Sectors

Sectors	Infrastructure Strategies					Sample Sectors / Assets
	PPP / PFI		Core		Core + / Value Add	
	Greenfield	Brownfield	Greenfield	Brownfield	Brownfield	
Mid-stream Energy	N/A	N/A				Pipeline / Storage
Power & Renewable	N/A	N/A				Solar / Wind / Gas
Utilities	N/A	N/A				Electricity / Gas Distribution
Transportation						Airports / Roads
Communication	N/A	N/A				Communication Towers / Cable Networks
Social					N/A	Education / Hospitals / Govt. Facilities
Waste						Waste Treatment

Opportunities Landscape – Fund / Investment Type

Sectors	Infrastructure Strategies				
	PPP / PFI		Core		Core + / Value Add
	Greenfield	Brownfield	Greenfield	Brownfield	Brownfield
Closed-End	🟢	🟡	🟢	🟡	🟢
Open-Ended	🟡	🟢	🟡	🟢	🟡
Listed Infrastructure / MLP	🔴	🟡	🔴	🟡	🔴
Secondary Trade	🟡	🟢	🟡	🟢	🟢

Section 4:
Portfolio Construction Ideas

Building for Objectives – Model Portfolio

			Middle Model Portfolio	
Primary Objective		**Inflation Protection / Income Yield / Liability Matching**	**Income Yield / Return Seeking**	**Return Seeking**
Target Strategy		Core Infrastructure	Core / Core+ / Some Value Add	Value Add / Opportunistic / Complex
Target Sector		PPP / Social / Transportation / Some Energy	Regulated Utilities, Transporation / Energy & Power / Communication / Some PPP	Transporation / Energy & Power / Communication / Other
Investment Stage		Brownfield / Some Greenfield	Mainly Brownfield / Some Greenfield	Greenfield / Distressed or Value Brownfield / Complex Deals
Target Geographies		OECD	Mainly OECD	OECD and Emerging Markets
Revenue Model		Availability Based / Fixed Price Contracted	Regulated / Contracted with some volume and price risk (generally low)	Additional exposure to market price, volume, and regulatory risk
Typical Inflation Linkage		- Most assets have protection - 70-80% portfolio linkage	- Mix of explicit and implicit protection - 40-60% portfolio linkage	- Mix of some explicit and implicit - 30-40% of the portfolio linkage
Sensitivity to Economic Changes		Low	Low to Medium	Medium to High
Main Return Drivers		Income Distribution	Income Distribution, Capital Appreciation	Greenfield Premium, Income Distribution, Capital Appreciation once assets are de-risked and contracted
Available vehicles to implement		- Closed-end Private Funds - Open-ended Private Funds	- Closed-end Private Funds - Open-ended Private Funds - Listed Infrastructure Funds	- Closed-end Unlisted Funds
Allocation Guidance		30-50% of the program size	Up to 100% of the program size	< 20% of the program size
	Governance			
# of Managers	**Low**	1 Manager	1 Open-ended + 1 Secondary Closed	None
	Moderate	Up to 2 Managers	3 to 5 Managers	Up to 1 Manager
	High	Up to 2 Managers	5+ Managers	Up to 2 Managers
			Largest Opportunity Set in Infrastructure	

Low Governance Model Portfolio – 1) Building Strategic Position

Global Core Infrastructure

(Open-Ended)

- Large and Mid-Market
- Core Infrastructure Assets
- Long-term Contracted, Regulated and Concessions
- North American and OECD Options
- Diversified by Sub-Sectors
- Control Positions
- Some Active Management

✓ Strategic position for long term hold
✓ Select up to 2 open-ended funds
✓ 50-70% of the program size
✓ Low re-investment risk
✓ Cash yield play with modest appreciation

✓ Quarterly to Semi-Annual Subscription
✓ Quarterly to Semi-Annual Redemption (with possible lock-ups)
✓ Low cost exposure
✓ 12 to 35 underlying assets
✓ Buy, hold and manage strategies
✓ Moderate leverage

Low Governance Model Portfolio – 2) Achieving Diversification

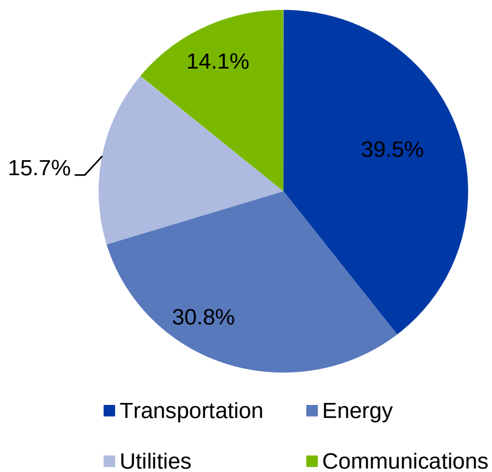
Infrastructure Secondary / Co-Investments

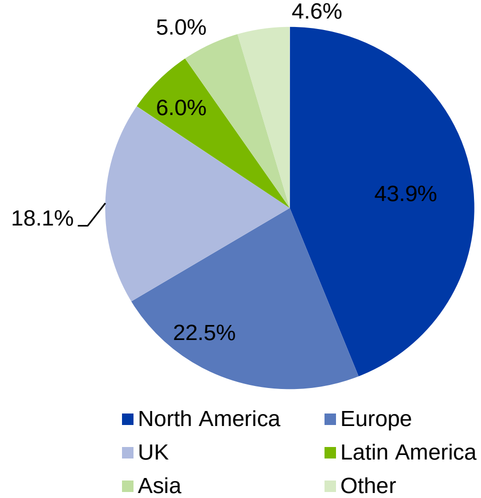
- Improve Diversification
- 10+ Infra Managers
- 10+ Co-investments
- 100+ Companies
  - 6+ Vintage Years
    - Core and Core+
      - Multi sub-sector

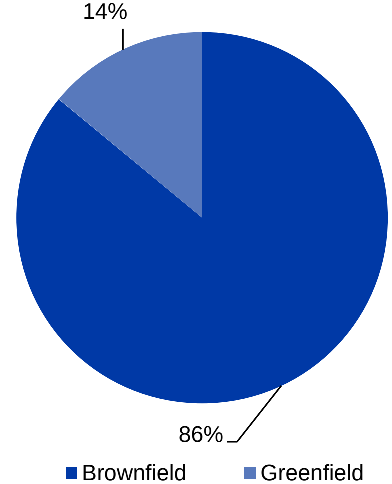
- ✓ Diversification and return enhancing position
- ✓ Select up to 2 funds or an SMA
- ✓ Funds may need to be rolled over every 3 to 5 years based on cash flow analysis
- ✓ Up to 50% of the program size
- ✓ Diversification, Risk Mitigation, and Return Enhancing Play

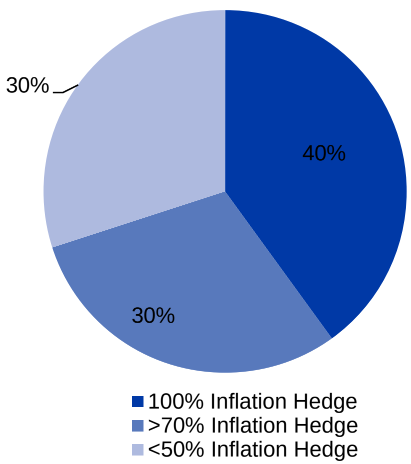
- ✓ Closed-ended fund or separate account with buy-rated manager
- ✓ 100+ portfolio companies and 200+ individual assets
- ✓ Lower J-curve and blind pool risk

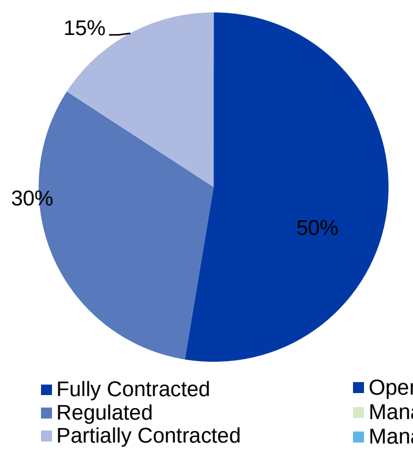
What would the Portfolio Look Like

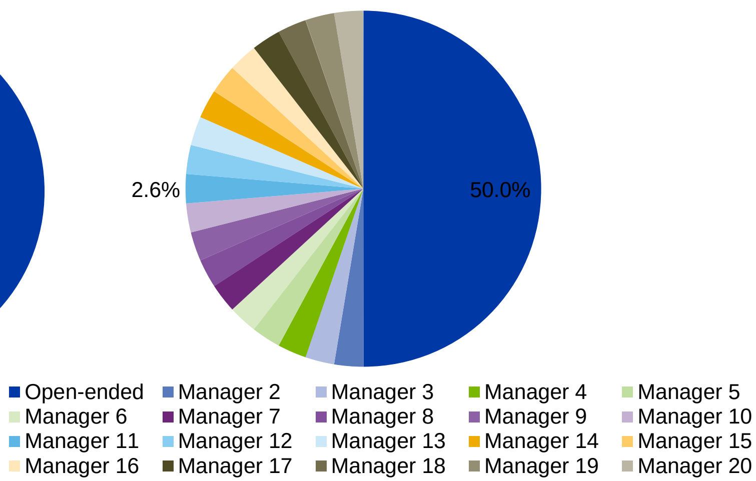


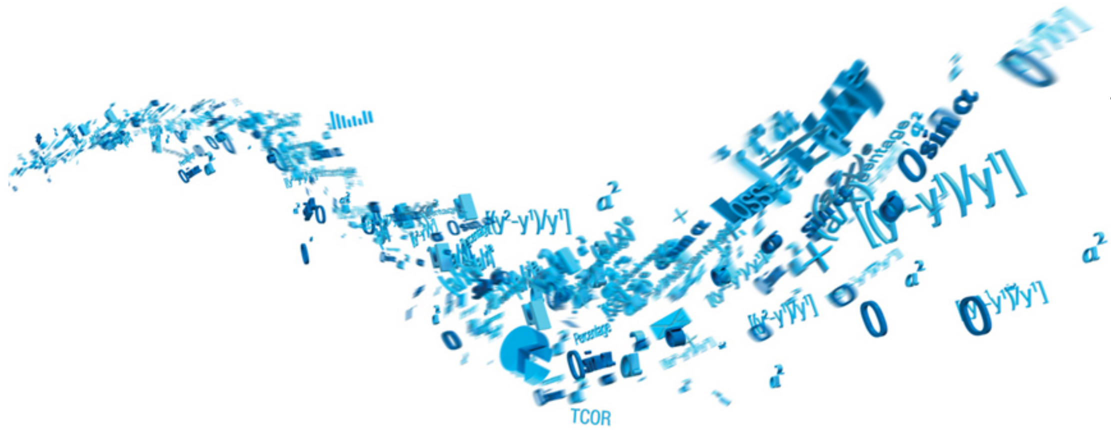












Appendix A: Glossary of Terms

Glossary of Terms – Private Equity

- **Private Equity:** Private equity is broadly defined as investments in privately negotiated securities that typically do not trade in a capital market. Investments are typically illiquid and long-term in nature, thereby introducing greater risk into a portfolio, which is generally rewarded by higher returns than traditional asset classes. Ennis Knupp & Associates classifies its private equity investments into the following categories: venture capital, buyouts, mezzanine, distressed debt, infrastructure, special situations, fund-of-funds, and co/ direct investments.

- **Vintage year**: The year of the first drawdown of capital.

- **Commitment**: A limited partner's obligation to provide a certain amount of capital to a fund.

- **Capital contribution**: The amount of capital drawn down by the general partner. Also known as the paid-in capital.

- **Distribution**: Cash or the value of stock disbursed to the limited partners of a fund.

- **Market value**: The carrying value of the remaining investments.

- **Internal rate of return (IRR):** The discount rate that equates the net present value (NPV) of an investment's cash inflows with its cash outflows.

- **Pooled IRR**: A method of calculating an aggregate IRR by summing cash flows together to create a portfolio cash flow and calculate IRR on portfolio cash flow. IRR is used in calculating returns of private equity funds because cash flows are determined by the manager as opposed to investors.

- **J Curve**: The curve realized by plotting the returns generated by a private equity fund against time (from inception to termination)

Glossary of Terms – Private Equity (cont'd)

Fund Classifications by Strategy

- **Venture Capital**
  - Seed – An entrepreneur has a new idea or product, but no established organization or structure. Investors tend to provide a few hundred thousand dollars and perhaps some office space to an entrepreneur who needs to develop a business plan.
  - Early-stage – The organization has been formed and has employees, and products are in the developmental stage. Early-stage investors back companies when they have a completed business plan, at least part of a management team in place, and perhaps a working prototype.
  - Later Stage – An established infrastructure is in place, and the company has a viable product that is market-ready and generating revenues. Later-stage investors typically provide financing for expansion of a company that is producing, shipping, and increasing its sales volume.

- **Corporate Finance/Buyouts -** A fund investment strategy involving the acquisition of a product or business, from either a public or private company, utilizing a significant amount of debt and some equity.

- **Mezzanine-** A fund investment strategy involving subordinated debt (the level of financing senior to equity and below senior debt).

- **Distressed Debt-** A fund investment strategy involving investment in equity or debt of companies that are unable to service existing debt, often including companies in, or preparing to enter bankruptcy.

- **Infrastructure -** A fund investment strategy involving investment in equity and debt securities in transportation, communication, sewage, water, and electric systems. These systems tend to be high-cost investments however they are needed for a country to be efficient and productive.

Glossary of Terms – Private Equity (cont'd)

Fund Classifications by Strategy (cont'd)

- **Fund-of-Funds**
  - A fund set up to distribute investments among a selection of private equity fund managers, who in turn invest the capital directly. Fund-of-funds are specialist private equity investors and have existing relationships with firms. They may be able to provide investors with a route to investing in particular funds that would otherwise be closed to them.

- **Co-Investments**
  - The syndication of a private equity financing round or an investment by a general partner alongside a private equity fund, in a financing round.

- **Fund Classifications by Fund Size**

• Small	\$0-500 million
• Medium	\$500 million – 1B
• Large	\$1B – 5B
• Mega	> \$5B

- **Fund Classifications by Portfolio Company Enterprise Value**

• Small	<\$100 million TEV
• Medium	\$100 million – \$1B TEV
• Large	\$1B – \$3B TEV
• Mega	> \$3B TEV

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