ANNUAL PRIVATIZATION REPORT: TRANSPORTATION FINANCE

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PART 1

INTRODUCTION

Since the late 1980s, governments have privatized many state-owned infrastructure enterprises, including airports, electric utilities, gas utilities, pipelines, railroads, seaports, telecommunication providers, and toll roads. Some of these facilities were sold to investors, in whole or in part (e.g., many European airports). In most other countries, public infrastructure facilities were leased to investors under long-term public-private partnerships (P3s). A growing number of governments are also using such P3s to finance, build, and operate new airports or airport terminals, electricity facilities, seaports, and toll roads. The sale or lease of an existing facility is called a “brownfield” transaction (in part because significant refurbishment may be needed). By contrast, P3s for brand new facilities are referred to as “greenfield” transactions.

In the United States, a significant amount of infrastructure is owned and operated by the private sector, including most U.S. energy production and distribution, electric and gas utilities and a fraction of water and wastewater utilities. These assets may be held through publicly traded corporations or (in the case of energy) master limited partnerships, or they may be owned directly by private investors. In transportation, however, nearly all U.S. airports, seaports, and toll roads are government-owned enterprises, generally by either state or local governments.

Both brownfield and greenfield infrastructure projects require long-term financing. In the public sector, such facilities are often financed 100% by government bonds, which in the United States are tax-exempt. When the private sector invests in infrastructure, it typically invests equity to cover part of the cost and finances the rest via either bank loans or long-term borrowing, such as revenue bonds. These large financing needs have led to the development and growth of infrastructure investment funds, most of which raise equity to invest in privately owned or P3 infrastructure. Public pension funds, seeking to increase their overall return on investments, are also making significant equity investments in revenue-generating infrastructure. Likewise, insurance companies and sovereign wealth funds are investing equity in private or privatized infrastructure.

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Inframation reports that in 2022 investors put $148.75 billion in new money into infrastructure investment funds.[1] Pension funds continued to increase their investment in infrastructure, in most cases by placing a specific allocation with one or more of the infrastructure funds, but a handful of large pension funds have built professional staffs that enable them to make direct investments in individual facilities.

This report reviews 2022 developments in the infrastructure investment fund world, focusing on transportation infrastructure. While the scope of the report is global, it pays particular attention to U.S. developments in P3 infrastructure and the growth of U.S. pension fund investing in this field. Part 2 reviews the continuing growth and scope of infrastructure investment funds worldwide. Part 3 then provides an update on the largest companies and major P3 projects underway globally and in the United States. Finally, Part 4 reviews pension funds' increasing investment in revenue-generating infrastructure.

1 "2022 Fundraising Report: As Another Record Falls, Smaller LPs May Join the Fray," *Inframation,* 24 January 2023.

PART 2

MAJOR INFRASTRUCTURE INVESTMENT FUNDS AND TRENDS

2.1 OVERVIEW

For many years, *Infrastructure Investor* has published a table of the amounts raised by the largest infrastructure investment funds over the latest five-year period. In 2021, the publication expanded this list to the largest 100 funds, and this practice continued for assessing trends in 2022. Table 1 lists the top 100 funds and the five-year total each had raised by autumn 2022. The five-year total raised by all 100 funds reached a record high $950.4 billion.[2]

TABLE 1: INFRASTRUCTURE INVESTOR 100, 2022

Rank	Fund Manager	Headquarters	Sum Raised ($M)	Europe	USA	Canada	Aust+ NZ	Asia, no China	China	Latin Am.	Mid-East
1	Macquarie Asset Management	London	$86,153	$86,153			.				
2	Brookfield Asset Management	Toronto	$77,178			$77,178					
3	Global Infrastructure Partners	New York	$71,712		$71,712						

[2] Kalliope Gourntis, "The Top 100 GPs Driving Infra's Unstoppable Rise," *Infrastructure Investor*, November 2022.

Rank	Fund Manager	Headquarters	Sum Raised ($M)	Europe	USA	Canada	Aust+ NZ	Asia, no China	China	Latin Am.	Mid-East
4	KKR	New York	$61,962		$61,962						
5	EQT	Stockholm	$43,091	$43,091							
6	Stonepeak	New York	$42,093		$42,093						
7	IFM Investors	Melbourne	$26,492				$26,492				
8	Blackstone	New York	$26,457		$26,457						
9	I Squared Capital	Miami	$25,565		$25,565						
10	Digital Bridge Group	Boca Raton	$21,541		$21,541						
11	BlackRock	New York	$21,316		$21,316						
12	AMP Capital	Sydney	$18,238				$18,238				
13	Copenhagen Infrastructure Partners	Copenhagen	$17,930	$17,930							
14	First Sentier Investors	Sydney	$17,484				$17,484				
15	Antin Infrastructure Partners	Paris	$16,226	$16,226							
16	Partners Group	Baar-Zug	$13,738	$13,738							
17	DIF Capital Partners	Schiphol	$13,033	$13,033							
18	ECP	Summit, NJ	$11,699		$11,699						
19	Ardian	Paris	$11,470	$11,470							
20	Actis	London	$11,330	$11,330							
21	Meridiam	Paris	$11,237	$11,237							
22	QIC Limited	Brisbane	$9,401				$9,401				
23	Equitix	London	$8,796	$8,796							
24	InfraVia Capital Partners	Paris	$8,657	$8,657							
25	Morgan Stanley Infrastructure Partners	New York	$8,629		$8,629						
26	Greencoat Capital	London	$8,301	$8,301							
27	InfraRed Capital Partners	London	$7,656	$7,656							
28	AIP Management	Copenhagen	$7,102	$7,102							
29	Goldman Sachs Asset Management	New York	$7,086		$7,086						
30	Vauban Infrastructure Partners	Paris	$6,951	$6,951							
31	iCON Infrastructure	London	$6,908	$6,908							
32	DWS	Frankfurt	$6,481	$6,481							
33	Infracapital	London	$6,333	$6,333							
34	IPI Partners	Chicago	$6,000		$6,000						
35	Apollo Global Management	New York	$5,941		$5,941						
36	GCM Grosvenor	Chicago	$5,860		$5,860						
37	F2i Sgr SpA	Milan	$5,832	$5,832							
38	Axium Infrastructure	Montreal	$5,786			$5,786					
39	Grain Management	Washington, DC	$5,695		$5,695						
40	National Investment & Infra. Fund	Mumbai	$5,490					$5,490			
41	The Carlyle Group	Washington, DC	$5,390		$5,390						
42	Dalmore Capital Limited	London	$5,366	$5,366							
43	Swiss Life Asset Managers	Zürich	$5,330	$5,330							
44	EnCap Investments*	Houston	$5,065		$5,065						
45	China Merchants Capital	Shenzhen	$5,055						$5,055		

Rank	Fund Manager	Headquarters	Sum Raised ($M)	Europe	USA	Canada	Aust+ NZ	Asia, no China	China	Latin Am.	Mid-East
46	Argo Infrastructure Partners	New York	$4,913		$4,913						
47	Basalt Infrastructure Partners	London	$4,766	$4,766							
48	Capital Dynamics	Zug	$4,684	$4,684							
49	Asterion Industrial Partners*	Madrid	$4,525	$4,525							
50	Manulife Investment Management	Boston	$4,403		$4,403						
51	GLIL Infrastructure	London	$4,166	$4,166							
52	Allianz Global Investors	New York	$4,089		$4,089						
53	Energy Infrastructure Partners	Zürich	$4,028	$4,028							
54	Ullico Investment Advisors*	Washington, DC	$3,887		$3,887						
55	Northleaf Capital Partners	Toronto	$3,816			$3,816					
56	Cube Infrastructure Managers	Luxembourg	$3,638	$3,638							
57	ArcLight Capital Partners	Boston	$3,573		$3,573						
58	Oaktree Capital Management	Los Angeles	$3,424		$3,424						
59	LS Power Group	New York	$3,424		$3,424						
60	Ares Management	Los Angeles	$3,341		$3,341						
61	Mirova	Paris	$3,212	$3,212							
62	Generate Capital	San Francisco	$3,200		$3,200						
63	Aquila Capital	Hamburg	$3,144	$3,144							
64	Amber Infrastructure Group	London	$3,013	$3,013							
65	Quinbrook Infrastructure Partners	London	$2,884	$2,884							
66	3i Group	London	$2,826	$2,826							
67	GI Partners	Scottsdale	$2,757		$2,757						
68	Mexico Infrastructure Partners	Mexico City	$2,751							$2,751	
69	SDC Capital Partners	New York	$2,558		$2,558						
70	Foresight Group	London	$2,446	$2,446							
71	Ancala Partners	London	$2,380	$2,380							
72	Arjun Infrastructure Partners	London	$2,339	$2,339							
73	Morrison & Co.*	Wellington	$2,328				$2,328				
74	Patria Investments	São Paulo	$2,294							$2,294	
75	Instar Asset Management	Toronto	$2,282			$2,282					
76	Vision Ridge Partners	Boulder	$2,193		$2,193						
77	Tiger Infrastructure Partners*	New York	$2,191		$2,191						
78	JP Morgan Asset Management	New York	$2,189		$2,189						
79	China International Capital Corp.	Beijing	$2,180						$2,180		
80	Hy24*	Paris	$2,166	$2,166							
81	Infranode	Stockholm	$2,107	$2,107							
82	Patrizia AG	Augsburg	$2,096	$2,096							
83	abrdn	Edinburgh	$2,095	$2,095							
84	Palistar Capital	Greenwich	$2,090	$2,090							
85	First Infrastructure Capital Advisors	Houston	$1,995		$1,995						

Rank	Fund Manager	Headquarters	Sum Raised ($M)	Europe	USA	Canada	Aust+ NZ	Asia, no China	China	Latin Am.	Mid-East
86	CIM Group	Los Angeles	$1,856		$1,856						
87	NextEnergy Capital	London	$1,829	$1,829							
88	Qualitas Equity*	Madrid	$1,814	$1,814							
89	Intermediate Capital Group*	London	$1,735	$1,735							
90	Sustainable Development Capital*	London	$1,696	$1,696							
91	Alinda Capital Partners	Greenwich	$1,597		$1,597						
92	Prime Capital*	Frankfurt	$1,529	$1,529							
93	Strait Energy	Beijing	$1,504						$1,504		
94	Arcus Infrastucture Partners	London	$1,473	$1,473							
95	Vortex Energy*	Abu Dhabi	$1,469								$1,469
96	Arroyo Investors	Spring, TX	$1,427		$1,427						
97	Octopus Group	London	$1,302	$1,302							
98	American Infrastructure Patners	Foster City, CA	$1,278		$1,278						
99	Ridgewood Infrastructure*	New York	$1,273		$1,273						
100	Omnes Capital	Paris	$1,225	$1,225							
	Totals: $950,456		$950,456	$379,129	$387,579	$89,062	$73,943	$5,490	$8,739	$5,045	$1,469
	Total: 100%			39.89%	40.78%	9.37%	7.78%	0.58%	0.92%	0.53%	0.39%

*** Designates companies making their first appearance in the top-100.**
Source: *Infrastructure Investor*, November 2022

As Table 1 shows, these funds exist in many countries, but as in past years, North America and Europe account for the lion's share. The 2022 geographical breakdown is shown in Table 2.

TABLE 2: HEADQUARTERS LOCATION OF TOP 100 INFRASTRUCTURE INVESTORS

United States	$387.6 billion	40.78%
Europe	$379.1 billion	39.89%
Canada	$89.1 billion	9.37%
Australia/New Zealand	$73.9 billion	7.78%
China	$8.7 billion	0.92%
Other Asia	$5.5 billion	0.58%
Latin America	$5.0 billion	0.53%
Middle East	$1.5 billion	0.39%
5-Year Total:	**$950.4 billion**	**100%**

Source: Infrastructure Investor

The regions of origin of these infrastructure funds have not changed very much, with Europe and the United States as the predominant sources. Australia and Canada were pioneers in specialized infrastructure funds, and while they are still important, their relative shares are somewhat smaller than in previous annual tallies, due mainly to continued growth in U.S. and European funds.

Infrastructure data firm ION Analytics reports $820 billion in assets under management by the infrastructure fund industry as of the end of 2022. ION Analytics also reports that funds raised but not yet invested in infrastructure (termed "dry powder") increased from $303 billion in 2021 to $380 billion in 2022, thanks to the large increase in fundraising.[3]

Looking ahead, many new funds were in the market in the closing months of 2022. *Inframation* reported that "many [fund] managers have extended fundraising timelines into 1Q23 in order to take advantage of fresh investor allocations, and this overhang is again expected to keep the market buoyant through the first half of 2023."[4]

ION Analytics provided the data in Table 3 on the distribution of 2022 infrastructure investment by sector. Transportation moved into first place in 2022, after several years of being second or third in annual investment. It was also first in the number of projects. The 2022 increase in transportation project investment appears to have been driven by a number of larger-than-average projects reaching financial close in 2022.

TABLE 3: 2022 INFRASTRUCTURE INVESTMENT BY SECTORS

Sector	Value $B	% of Total	Projects	% of Total
Transportation	$108.359	72%	215	64%
Social Infrastructure	$27.286	18%	81	24%
Environmental	$6.534	4%	19	6%
Power	$4.780	3%	3	1%
Renewables	$1.105	1%	8	2%
Energy	$0.888	1%	6	2%
Telecommunications	$0.401	0%	5	1%
Commodities	$0.344	0%	1	0%
Total	**$149.697**	**99%**	**338**	**100%**

NOTE: Total percentages may not add to 100% due to rounding. Source: ION Analytics

3 Pablo Martinez, ION Group, email to Robert Poole, 8 March 2023.

4 "2022 Funding Report," *Inframation*, 24 January 2022.

Table 5—the 2022 table of the 15 largest P3 greenfield transportation projects—totals 87% more than its 2021 counterpart. This is due in part to 2022's two major airport terminal projects worth $13.2 billion and three urban rail projects totaling $10.4 billion, as shown in Table 5 on page 13 of this report.

2.2 EXAMPLES OF DIVESTITURES AND ACQUISITIONS

Most current infrastructure investment funds are "closed end," which means they raise money to invest for a pre-set period of time, typically 10 years. These funds are not "buy and hold" investors; rather, they seek to develop a portfolio that will be adjusted during its life to maximize the overall return to those who have placed funds with it. Hence, at various points in time during a fund's life, it will acquire investments, work to improve their operations, and then sell some holdings to realize value appreciation. This is not short-term "asset flipping" as is sometimes seen in housing markets. Rather, it is an ongoing process that seeks to optimize the performance of the investments in the fund. Transportation examples from 2022 included the following developments. The remainder of this section provides a sample of investment funds active in the field.

These funds are not "buy and hold" investors; rather, they seek to develop a portfolio that will be adjusted during its life to maximize the overall return to those who have placed funds with it.

Macquarie (#1 in 2022) engaged in various acquisitions and divestitures during the year. It put up for sale a portfolio of toll concession highways in India, attracting a number of bidders. Adani Enterprises was the winner, paying $392 million.[5] KKR (#4) and Cube Highways & Infrastructure (#56) also bid. Macquarie also put up for sale its 90% stake in a concession with Kiewit that rebuilt the Goethals Bridge in New York.[6]

5 Rouhan Sharma, "Adani Signs Deal to Buy Macquarie India Roads Portfolio," *Inframation News*, 4 August 2022.

6 Matt O'Brien and Bianca Giacobone, "Goethals Bridge P3 Set for Bids," *Inframation News*, 18 August 2022.

Brookfield (#2) and Spanish toll road company Abertis listed for sale Brazilian highway operator Arteris, which operates nearly 2,000 miles of tolled highways in five Brazilian states.[7]

EQT (#5) launched a €5 billion core infrastructure fund, EQT Active Core Infrastructure. It will target investments in Europe and North America at the lower end of the risk-return spectrum, with plans to hold assets for 15 to 25 years.[8]

Blackstone (#8), CDP Equity, and Macquarie won the bidding for the toll roads of Italian firm Atlantia. The sale was valued at €8.2 billion.[9] CDP is an Italian sovereign wealth fund.

IFM Investors (#7) offered nearly €3 billion for the 60% of Vienna Airport that it did not already own.[10] When that was not accepted, IFM offered to buy another 10% of the airport's shares.[11] In June, IFM bought a 15% stake in Australian toll road investor Atlas Arteria and increased its stake to 19% in August.[12] In September, IFM objected to Atlas' bid to buy a majority stake in the Chicago Skyway concession.[13] Atlas went ahead with its bid, and in October IFM acquired additional shares in Atlas. In December, it appointed a senior IFM official, Ken Daley, to the Atlas board.[14] Separately, IFM-owned Spanish toll road operator Aleatica put up for sale two of its Mexican toll roads.[15]

DIF Capital Partners (#17), in a consortium with Vauban Infrastructure Partners (#30) and Egis, was among a number of proposed bidders for a 25-year P3 concession to operate and maintain the Athens ring road network.[16] Other teams were headed by Ardian (#19), Vinci, Brisa, Abertis, and Macquarie. DIF was also among the bidders for the concession of Spain's Autopista de Sureste.[17]

7 Gabriela Valente, "Morgan Stanley Mandated to Sell Highway Operator Arteris," *Inframation News*, 22 July 2022.
8 Pablo Martinez, "EQT Infra Formally Launches Long awaited Core Infra Fund," *Inframation News*, 2 March 2022.
9 Lakshmi Iyer, "Atlantia Nets EUR 8.2BN from Italian Toll Road Operator Sale," *Inframation News*, 6 May 2022.
10 Rory Gallivan, "IFM Launches Bid to Take Control of Vienna Airport," *Inframation News*, 13 June 2022.
11 Norbert Bata, "IFM Makes Offer for Vienna Airport at 25.5% Premium," *Inframation News*, 6 July 2022.
12 Sonu Mohanty, "IFM Raises Stake in Australia's Atlas Arteris to 19%," *Inframation News*, 4 August 2022.
13 Shaun Drummond, "IFM Demands Atlas Withdraw Chicago Skyway Bid," *Inframation News*, 12 September 2022.
14 Sonu Mohanty, "Atlas Arteria Proposes Appointment of IFM Representative to Board," *Inframation News*, 20 December 2022.
15 Jonathan Carmody, "Details Emerge on Aleatica Mexican Highway Sales," *Inframation News*, 19 October, 2022.
16 Antonio Fabrizio, "Europe's Top Infra Funds Bid for Athens Ring Road," *Inframation News*, 5 May 2022.
17 Antonio Fabrizio, "Infra Funds File Binding Bids for Spanish Toll Road," *Inframation News*, 27 May 2022.

GLIL Infrastructure (#51) bought a 25% stake in the U.K. M6 Toll Road concession from IFM Investors, for an undisclosed sum.[18]

In some such transactions, infrastructure funds may buy some or all of the equity invested by the original construction-oriented companies that won the concessions and took on initial risks such as environmental permitting, late completion, and construction cost overruns. Once those risks are in the past, the operational project has lower overall risk, and better fits the criteria of many infrastructure investment funds. Other funds are willing to be greenfield investors, taking the early-stage development and construction risks in hopes of a higher return on their equity investment.

2.3 NEWER TYPES OF FUNDS

While closed-end infrastructure funds of 10 to 12 years' duration remain the most common type, there is a growing trend of new funds with 25-year or indefinite lives. That is consistent with the desire of investors (such as pension funds and insurance companies) seeking long-term revenue streams generated by revenue-producing infrastructure.[19]

"While closed-end infrastructure funds of 10 to 12 years' duration remain the most common type, there is a growing trend of new funds with 25-year or indefinite lives."

Two pioneers in this trend were IFM Investors and Meridiam Infrastructure (#21). IFM launched its open-ended Global Infrastructure Fund in 2004, and Meridiam began a series of 25-year funds in 2007. Meridiam founder Thierry Deau told *Infrastructure Investor*, "There was a growing appetite for long-term assets for certain types of [limited partners]," which led Meridiam to move into long-term funds.[20] IFM's motivation was to match its infrastructure investments with the long-term liabilities of its public pension fund owners.

18 Brendan Malkin, "GLIL Buys Stake in UK Toll Road," *Inframation News*, 23 January 2022.

19 Zak Bentley, "Deep Dive: Is It Time to Take a Closer Look at Long-Term Funds?" *Infrastructure Investor.com*, 2 April 2020.

20 Ibid. 2 April 2020.

Among other entities that have launched long-term and open-ended funds are Blackstone, Macquarie, J. P. Morgan Asset Management, Carlyle Group, Global Infrastructure Partners, and EQT Infrastructure.

The trend accelerated in 2022. *Infrastructure Investor* reported that "Over the past year-and-a-half, $55 billion of permanent capital was raised [for open-end funds], accounting for 39% of all such equity fundraising since inception," based on data from consultancy finance.[21] One of those making new commitments was IFM Investors. It raised commitments from two U.K. public pension funds, two private pension funds, and the Bank for International Settlements.[22]

Another relatively new type of fund is the infrastructure debt fund. *The Wall Street Journal* reported in July 2021 that debt funds of this kind raised $20.13 billion in 2020. Reporter Luis Garcia noted that "Institutional investors are embracing infrastructure debt strategies as they see a chance to earn higher returns compared with plain-vanilla fixed-income investments and at a low risk compared with other types of lending."[23]

Another category of long-term infrastructure investor comprises sovereign wealth funds. One that was in the news in 2022 is the Indonesia Investment Authority. In April it committed to investing $2.7 billion in toll roads, buying them from two state-owned developers. Three other infrastructure investors—Canadian pension fund CDPQ, APG, and the Abu Dhabi Investment Authority—were reportedly considering investing alongside the Indonesian Authority.[24]

21 News release, *Infrastructure Investor*, 14 December 2022.

22 Attila Veszelovsky, "IFM Raises Five Further Commitments," *Inframation News*, 18 July 2022.

23 Luis Garcia, "Infrastructure Debt Strategies Rise," *The Wall Street Journal*, 23 July 2021.

24 Eduard Fernandez, "The Indonesia Investment Authority Announced USD 2.7BN Road Acquisition," *Inframation News*, 14 April 2022.

PART 3

P3 COMPANIES AND PROJECTS

3.1 GLOBAL COMPANIES AND PROJECTS

During 2022, infrastructure investors financed $149.697 billion worth of infrastructure transactions (including transportation), encompassing new (greenfield) projects, acquisition of existing facilities, and refinancing already-owned facilities. Greenfield projects set a new annual high of $72.6 billion, representing 48% of the investment and 53% of the number of deals. Table 4 provides a breakdown of this investment by type of transaction.

TABLE 4: 2022 INFRASTRUCTURE INVESTMENTS BY TYPE

Deal Type	Value $B	% of Total	Number	% of Total
Greenfield	$72.586	48%	178	53%
M & A	$34.446	23%	60	18%
Refinancing	$22.463	15%	74	22%
Take Private	$13.120	9%	1	0%
Other	$6.672	4%	25	7%
Nationalize	$0.410	0%	1	0%

Source: ION Analytics

Table 5 lists the 15 largest greenfield transportation infrastructure P3 projects worldwide financed in 2022, totaling $38.2 billion. Three of these projects are located in the United

States, compared with only one of the top-15 in 2021. The two largest projects are both new airport terminals at Kennedy International Airport in New York.

TABLE 5: MAJOR GREENFIELD TRANSPORTATION P3S FINANCED IN 2022

Country	Project	Sector	Value $B	Lead Developers
USA	JFK New Terminal One	Airports	$8.442	Ferrovial, JLC, Ullico, Carlyle
USA	JFK Terminal 6	Airports	$4.735	American Triple I, RXR Realty, JefBlue, Vantage Airport Group
Colombia	Metro de Bogotá Line 1	Urban Rail	$4.400	Xi'an Metro, China Harbor Engineering
Australia	Western Sydney Airport Link	Urban Rail	$3.339	Plenary, Siemens, Webuild, RATP
USA	MD Purple Line Renewed	Urban Rail	$2.683	Star America, Meridiam
India	Navi Mumbai Airport	Airports	$2.529	Adani Group
USA	PA Major Bridges Program	Highways & Bridges	$2.300	Shikun & Binui, Macquarie
Turkey	Antalya Airport Concession	Airports	$2.013	Fraport, TAV Airports
Canada	Ontario Line	Rolling Stock	$1.723	Transdev, Webuild, Hitachi, Plenary
Peru	Jorge Chavez International Airport	Airports	$1.250	Fraport, IFC
Cyprus	Larnaca Port & Marina	Seaports	$1.104	Alexandrou, Eldeman Holding
Norway	Sotra Connection (Rv 555)	Highways & Bridges	$1.097	Webuild, Macquarie
Australia	Gold Coast Light Rail Extension	Urban Rail	$0.899	Palisade's Australian Social Infra. Fund, Marubeni, Keolis, INPP
Canada	Ontario Line Southern Station	Urban Rail	$0.863	Ferrovial, Vinci
India	Meera-Budaun Highway	Highways & Bridges	$0.838	IRB Infrastructure Developers

Source: ION Analytics

The transportation modes in Table 5 for 2022 differed considerably from 2021's. The highways & bridges sector dominated in 2021, while airports accounted for just under 50% of the top-15 greenfield projects in 2022. Urban rail came in second, at just under 32% of greenfield investment, with highways and bridges at 11%, railroads at 4.5%, and ports at 2.6%. The top-15 total for 2022 was $38.215 billion compared with $20.389 billion in 2021.

Table 6 lists the world's largest transportation P3 infrastructure developers by number of projects in operation or under construction. Since some projects may involve more than one of these companies, the total number of company involvements exceeds the number of projects. The data tallied here are for projects with more than $50 million in investment value.

TABLE 6: WORLD'S LARGEST TRANSPORTATION P3 DEVELOPERS, BY NUMBER OF PROJECTS THROUGH 2022

Investor	Headquarters	Number of Projects
Vinci	France	58
Abertis	Spain	46
Meridiam	France	46
Sacyr	Spain	42
ACS/Iridium	Spain	39
Macquarie	Australia	39
Ferrovial/Cintra	Spain	29
ASTM/Itinera	Spain	25
Transurban	Australia	24
Invesis	Netherlands	21
John Laing	UK	16
Plenary	Australia	16
FCC	Spain	14
Balfour Beatty	UK	13
Fluor	USA	9
Skanska	Sweden	9
Acciona	Spain	8
SNC-Lavalin	Canada	7
Egis	France	6
Star America	USA	5
Shikun & Binui	Israel	5
Kiewit	USA	3

Source: *Public Works Financing* analysis, Major Projects Database, 2022

As can be seen, P3 developers headquartered in Europe, where long-term DBFOMs were first pioneered in the 1970s, account for 15 of the 23 developers in the table. Australia comes in next with three global P3 developers, followed by three U.S. developers with a smaller number of projects. Canada and Israel have one each.

Just as infrastructure funds adjust their portfolios of projects they have invested in from time to time, so do P3 developers. Some retain a portfolio of P3 projects they have developed for long periods. Others tend to retain only some projects, while selling portions or all of others to create a more balanced portfolio of operational projects. Here are some examples from 2022.

- Ferrovial's Cintra decided to sell its remaining 15% interest in Spain's Autopista del Sol toll road, as part of its "asset rotation strategy to sell mature assets."[25] Bestinver and Meridiam acquired the stake.
- Eight consortia, including infrastructure funds and P3 developers such as Abertis, Macquarie, and Vinci, bid for stakes in the concession for the Athens ring road network.[26]
- P3 developer Vinci acquired 55% of the concession company that built and operated 354 miles of toll roads in São Paulo state.[27]
- John Laing and Cintra acquired Aberdeen's 7.135% stake in the I-77 express toll lanes project in North Carolina.[28]
- ACS Group bought out two of its partners in the SH-288 concession in Texas, buying a 12.11% stake from insurer Call Insurance and a 44.65% stake from several infrastructure investment funds.[29]
- Vinci Concessions and Aktor Concessions increased their combined stake in the Rion-Antirion Bridge in Greece to 72.3%, buying out their partner Avax.[30]
- Abertis shareholders Atlantia and ACS increased their investment in the company by €1 billion in November to support additional investments in P3 infrastructure.[31]
- Vinci increased its controlling stake in Mexican airport company OMA by acquiring an additional 29.99% stake in December.[32]
- Atlantia sold its entire holding in German P3 developer Hochtief as part of its strategy to sell non-core assets.[33]

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25 Antonio Fabrizio, "Infra Funds Buy Remaining Stake in Spanish Toll Road," *Inframation News*, 1 December 2022.

26 Antonio Fabrizio, "Europe's Top Infra Funds Bid for Athens Ring Road," *Inframation News*, 5 May 2022.

27 Press release, "Vinci Buys Patria Stake in Brazilian Toll Road Concessionaire Entrevias," *Inframation News*, 1 December 2022.

28 Press release, "John Laing, Ferrovial Boost Stakes in Road Concession," *Inframation News*, 1 December 2022.

29 Press release, "ACS Further Increases Stake in SH-288," *Inframation News*, 24 October 2022.

30 Antonio Fabrizio, "Vinci, Aktor Pay Euro 60M for Greek Toll Bridge Stake," *Inframation News*, 23 November 2022.

31 Antonio Fabrizio, "Abertis Shareholders Inject Eur 1BN for Growth Investments," *Inframation News*, 30 November 2022.

32 Press release, "Vinci Completes Acquisition of Controlling Sake in Mexican Airport Operator," *Inframation News*, 8 December 2022.

33 Antonio Fabrizio and Stefano Berra, "Atlantia Grows Cash Mountain with Hochtief Stake Sale," *Inframation News*, 15 September 2022.

- Sacyr announced plans to sell up to 49% of each of its six toll road concessions in Colombia, together worth $4.3 billion.[34]
- Transurban refinanced $245 million of debt on its M5 West Motorway project in Sydney, Australia; the company owns 100% of the equity in that long-term concession project.[35]

3.2 U.S. COMPANIES AND PROJECTS

Table 7 lists the 12 largest developers of P3 transportation projects in the United States through the end of 2022. Here the breakdown is less European and more widely diversified. Though the five European companies are still in the lead in both amount invested and number of projects, U.S.-headquartered developers now account for four of the 12, along with five from Europe and three from Australia.

TABLE 7: TOP U.S. P3 TRANSPORTATION DEVELOPERS, BY PROJECT VALUE TO DATE

Name	Headquarters	Number of Projects	Project Value ($B)
Meridiam	France	9	$18.684
Ferrovial/Cintra	Spain	7	$21.200
ACS	Spain	6	$11.049
Fluor	USA	6	$14.700
John Laing	UK	5	$10.085
Macquarie	Australia	4	$4.649
Skanska	Sweden	3	$8.881
Transurban	Australia	3	$3.331
Plenary	Australia	3	$1.463
Star America	USA	3	$4.353
Walsh	USA	2	$2.437
Kiewit	USA	2	$1.088

Source: *Public Works Financing* analysis, 2022 Major Projects Database

Finally, Table 8 provides an overview of U.S. greenfield transportation DBFOM P3 projects since the first such projects were financed in 1993. Prior to the advent of the federal TIFIA loan program and tax-exempt private activity bonds (PABs), the earliest projects were financed by taxable bank debt. Since the advent of the two federal financing tools, most

34 Press report, *Inframation News*, 11 January 2023.

35 Shaun Drummond, "Transurban Refinances M5 West Motorway Project Debt," *Inframation News*, 23 May 2022.

such projects in surface transportation have used TIFIA or PABs or both to be competitive with the tax-exempt bonds available to state transportation agencies.

Since the advent of the two federal financing tools, most such projects in surface transportation have used TIFIA or PABs or both to be competitive with the tax-exempt bonds available to state transportation agencies.

These projects are separated into two groups; those in the top half are financed based on project-derived revenues, denoted as "revenue-risk" (RR). In the lower half of the table are projects financed based on annual availability payments from the sponsoring agency, denoted as "availability-pay" (AP). As Table 8 shows, a much higher level of equity is invested in the RR projects, because the investors are taking on revenue risk in addition to risks that are common to both types of P3 (such as construction cost overruns and late completion). They are taking on greater risk, so RR investors put in more equity, because creditors demand it. The additional equity has two important benefits. First, the state financing contribution is much less for the RR projects, saving taxpayers money. Second, the larger amount of equity as a percentage of the overall project financing provides a cushion in the event of a recession, when user fee revenues are likely to decrease. Debt service must be paid regardless, so if the debt is a smaller fraction of the project cost, it is easier to service that debt when revenues decline.

TABLE 8: HISTORICAL OVERVIEW OF U.S. LONG-TERM P3 GREENFIELD PROJECTS

Project	Type	Govt. Grant (M)	Infra Bank Loan (M)	TIFIA (M)	PABs (M)	Bank Debt (M)	Equity (M)	Total (M)	% Equity	Financial Close
91 Express Lanes	RR	0		0	0	$100	$30	$130	23%	1993
Dulles Greenway	RR	0		0	0	$298	$80	$378	21%	1993
S. Bay Expressway	RR	0		$140	0	$340	$130	$610	21%	2003
I-495 Express	RR	$495		$598	$589	0	$630	$2,312	27%	2007
SH 130, Seg. 5-6	RR	0		$430	0	$686	$210	$1,326	16%	2008
N. Tarrant Express, TX	RR	$594		$650	$398	0	$426	$2,068	21%	2009
LBJ Expressway, TX	RR	$490		$850	$606	0	$682	$2,628	26%	2010
Midtown Tunnel, VA	RR	$582		$422	$675	0	$272	$1,951	14%	2012
I-95 HOT, VA	RR	$83		$300	$253	0	$280	$916	31%	2012
N. Tarrant 3A/B, TX	RR	$379		$531	$274	0	$442	$1,626	27%	2013
US 36, Ph. 2, CO	RR	$75		$60	$21	0	$41	$197	21%	2014
I-77 MLs, NC	RR	$95		$189	$100	0	$248	$632	39%	2015
SH 288, TX	RR	$17		$357	$100	0	$375	$849	44%	2016
I-66, VA	RR	$0		$1,229	$737	0	$1,549	$3,515	44%	2017
I-95, ext., VA	RR	$0		$0	$277	0	$532	$809	66%	2019
N. Tarrant, 3C, TX	RR	$14		$0	$750	0	$160	$924	17%	2019
Newark ConRAC	RR	$110		$0	$0	$310	$60	$480	13%	2019
Belle Chasse Bridge, LA	RR	$45		$0	$110	0	$28	$183	15%	2019
I-495 NEXT (VA)	RR	$0	$49	$212	$225	0	$268	$754	36%	2021
JFK New Terminal One	RR	$0	$0	$0	$0	$6,630	$2,330	$8,960	26%	2022
JFK Terminal 6	RR	$0	$0	$0	$435	$3,009	$1,300	$4,744	27%	2022
Total		$2,979	$49	$5,968	$5,550	$11,373	$10,073	$35,992		
Average		$142	$2	$284	$264	$542	$480	$1,714		
Percent		8.3%	0.0%	16.6%	15.4%	31.6%	28.0%			
I-595, FL	AP	0		$603	0	$781	$208	$1,592	13%	2009
Port Miami Tunnel	AP	$100		$341	0	$342	$80	$863	9%	2009
Denver Eagle rail	AP	$1,312		$280	$396	$0	$54	$2,042	3%	2010
Presidio Pkway Ph 2	AP	0		$150	0	$167	$45	$362	12%	2012
East End Bridge	AP	$526		$162	$508	$0	$78	$1,274	6%	2013
Goethals Bridge	AP	$125		$474	$453	$0	$107	$1,159	9%	2013
I-69, IN	AP	$80		$0	$244	$0	$41	$365	11%	2014
I-4 , FL	AP	$1,035		$950	$0	$484	$103	$2,572	4%	2014
Penn. Rapid Bridges	AP	$255		$0	$721	$0	$59	$1,035	6%	2015
Portsmouth Bypass	AP	$178		$209	$227	$0	$49	$663	7%	2015
Purple Line rail refinance	AP	$852		$1,760	$643	$0	$293	$3,548	8%	2022
LaGuardia Terminal	AP	$1,200		$0	$2,400	$0	$200	$3,800	5%	2016
I-70, CO	AP	$687		$404	$141	$0	$65	$1,297	5%	2017
LAX People Mover	AP	$1,031		$0	$1,295	$269	$103	$2,698	4%	2018
LAX ConRAC	AP	$690		$0	$458	$73	$43	$1,264	3%	2019
PA Major Bridges	AP	$140		$0	$1,759	$0	$202	$2,101	10%	2020
Total		$8,211		$5,333	$9,245	$2,116	$1,730	$26,635		
Average		$538		$356	$499	$141	$102	$1,551		
Percent		30.8%		20.0%	34.7%	7.9%	6.5%			

Sources: *Public Works Financing*, ION Analytics, and U.S. DOT

3.3 PROJECTS IN THE U.S. TRANSPORTATION DBFOM PIPELINE

3.3.1 HIGHWAY P3S

Georgia DOT has the largest pipeline of projects: a set of major improvements to the metro Atlanta freeway system, nearly all of which will add express toll lanes (ETLs) to congested freeways. The first project, under procurement as of early 2023, adds ETLs to 16 miles of SR 400 at an estimated cost of $2 billion.[36] This will be followed by three major projects on the "top end" of the I-285 ring road, each including major interchange reconstruction. In fact, GDOT is addressing most of the top 20 traffic bottlenecks identified in the American Transportation Research Institute's (ATRI) annual report on America's 100 most-serious truck bottlenecks: I-285/I-20 West (#5), I-75 southeast of Atlanta (#13), and I-285/I-20 East (#17). Doing four of these projects as revenue-risk P3s will free up GDOT funds for the others.

Louisiana DOTD has two major bridge projects moving forward to be financed as revenue-risk P3s. Already under procurement is the $1.5 billion Calcasieu Bridge replacement, which is projected to select its preferred bidder in 2023.[37] Several years away will be the $2 billion project to add an additional bridge across the Mississippi River near Baton Rouge to help relieve bottleneck #20 on the ATRI list.[38]

North Carolina DOT has begun developing the procurement process for a revenue-risk P3 to add two express toll lanes each way to I-77 between Charlotte and the South Carolina border. The project has been in the long-range transportation plan for years but had not been funded. NCDOT responded to an unsolicited proposal from Cintra (P3 developer of the ETLs on I-77 north of Charlotte). The Charlotte area MPO authorized NCDOT to develop a competitive procurement for the new project in early 2023.[39]

Puerto Rico's P3 Authority has sought bids from P3 developers for long-term leases of four state-run toll roads: PR-20, PR-52, PR-53, and PR-66. In January 2023 it shortlisted teams

36 Jim Parsons and Richard Korman, "How Georgia Sweetened Deal for the SR 400 Toll Lanes P3," *Engineering News-Record*, 31 October, 2022.

37 Liam Ford, "Louisiana Expects Spring RFP for Bridge P3," *Inframation News*, 4 January 2023.

38 Liam Ford, "Louisiana Megaproject Law Funds P3s," *Inframation News*, 21 June 2022.

39 Michael Bennon, "Key Vote Moves I-77 Express Lanes Project Forward," *Public Works Financing*, February 2023.

headed by Abertis, Plenary, and Sacyr.[40] The island's two toll roads in the San Juan metro area were P3-leased in 2009 and are operated under a 40-year toll concession by Abertis.

Tennessee DOT and Gov. Bill Lee are working to enact P3 legislation that would permit revenue-risk projects to add express toll lanes to congested freeways in Nashville and several other cities. As of March 2023, the bill has passed both houses of the legislature.[41]

Texas DOT has authorized Cintra to proceed with the last capacity additions included in its 50-year North Tarrant Express concession. The project will add an additional general-purpose lane and an additional ETL each way on the Loop 820/SH-121/183 Airport Freeway corridor in northeastern Tarrant County. Cintra expects to reach financial close on the $300 million–$350 million project by the end of 2023.[42]

A big unknown has been the $3 billion Maryland P3 project to replace the aging American Legion Bridge and add ETLs on I-495 from there to I-270 and up the I-270 corridor to I-370. Delays in getting the 2022 Record of Decision led to the project not receiving final state approvals during the term of Gov. Larry Hogan, who had championed the project. A team of Macquarie and Transurban won the bidding for this revenue-risk project; they were finalizing the specifics that would have to be voted on by the Maryland Board of Public Works in order to reach commercial and financial close. In a surprise announcement on March 9, Transurban announced that the team was giving up on the project,[43] leaving its future in the hands of the new governor.

Two other potential P3 projects might be procured as either revenue-risk or availability-payment projects.

- Indiana and Kentucky DOTs are cooperating on plans for a new bridge to bring under-construction I-69 across the Ohio River. Tolling is assumed to be needed for the project, and the two states collaborated on the Ohio River Bridges project at Louisville, in which one of two new bridges was developed as a hybrid toll/availability-payment bridge.[44]

40 Michael Bennon, "Puerto Rico P3s Advance," *Public Works Financing*, January 2023.

41 Eugene Gilligan, "Tennessee Legislative Committee Advances Managed Lanes Bill," *Inframation*, 28 February 2023.

42 Eleanor Dearman, "Plans Underway to Expand Often-Congested Highway in Northeast Tarrant County," *Fort Worth Star-Telegram*, 17 February 2023.

43 Erin Cos and Luz Lazo, "Toll Road Operator Withdraws from Plan to Develop Beltway, I-270 Toll Lanes," *The Washington Post*, 9 March 2023.

44 Stantec, Inc., "Construction Begins on I-69 Ohio River Crossing Section1 in Kentucky," 2 August 2022.

- Virginia DOT is analyzing the feasibility of adding ETLs on the missing link of the ETLs on its half of the I-495 Beltway—between I-95 and the Woodrow Wilson Bridge. If the project is found to be feasible, it will likely be developed and operated as a revenue-risk P3, as are all the other ETLs in the northern Virginia suburbs of Washington, D.C.[45]

3.3.2 AIRPORT P3 PROJECTS

Three DBFOM terminal projects are underway at Kennedy International Airport (JFK) in New York City. Two of them reached financial close in 2022, with the third expected to do likewise in 2023.

JFK New Terminal One (NTO) is the largest of the three, at an estimated cost in the $9 billion range. Originally launched with Carlyle Group as its lead investor, that changed in February 2022 when Ferrovial Airports acquired 96% of Carlyle's 51% share in the project. Other investors include JLC Infrastructure and Ullico. NTO will replace existing Terminals 1 and 2 and will become JFK's largest terminal. The deal reached financial close in June at $8.86 billion, not including working capital and letter of credit.[46] The bank debt will be replaced with private activity bonds (PABs) in 2024–2026.[47] Developer equity was 26% of the total (see Table 8). The revenue source is fees from airlines using the terminal.

The other project that reached financial close is Terminal 6, with the P3 company consisting of JetBlue Airways, Vantage Airport Group, and American Triple I.[48] The deal closed at $4.75 billion, with the same type of revenue source as NTO. The new terminal will occupy the current site of former Terminals 6 and 7. Still in the pipeline at JFK is the $1.5 billion Terminal 4 renovation and expansion—a joint venture of Delta Air Lines and JFK International Air Terminal (IAT), the P3 developer of the original Terminal 4.

45 Luz Lazo, "Here Is Virginia's Plan to Grow Its Network of Express Lanes in 20223," *The Washington Post*, 29 December 2022.

46 Giulio Comellini (ION Group), email to Robert Poole, 7 March 2023

47 Michael Bennon, "Financial Close for $9.5 Billion JFK Terminal One," *Public Works Financing*, June 2022.

48 Liam Ford, Matt O'Brien, and Eugene Gilligan, "Financing for JFK Terminal 6 P3 Coming into Focus," *Inframation News*, 10 November 2022.

> *Another 2022 milestone was the opening of the last portions of Terminal B at New York's LaGuardia Airport in July.*

Another 2022 milestone was the opening of the last portions of Terminal B at New York's LaGuardia Airport in July. Described by a leading newsletter as "one of the largest P3s in U.S. history," the nearly $4 billion project received the Prix Versailles award for the world's best new airport terminal in 2021.[49]

Another notable airport P3 is the DBFOM project to modernize the airport of New Haven, Connecticut (HVN). Avports, which has managed HVN for several decades, reached a deal with the city of New Haven under which it will refurbish the small existing terminal, lengthen the runway, and build a replacement terminal, under a 43-year P3 lease.[50] HVN is the first mainland airport in the United States to be P3-leased under the FAA's Airport Investment Partnership Program (AIPP). The only other P3-leased airport is that of San Juan, Puerto Rico, which was P3 leased in 2013 under the previous FAA Airport Privatization Pilot Program. The HVN P3 was motivated by the airport having attracted a startup airline, Avelo, now offering flights to more than two dozen destinations. Neither the existing runway nor the existing terminal is adequate for this level of airline service.

Coming up in 2023 are DBFOM P3 leases for air cargo facilities at Los Angeles International Airport (LAX) and Phoenix Sky Harbor Airport (PHX). The aim of the LAX project is for a developer to modernize and operate the airport's 27 cargo buildings with 3.5 million sq. ft. of ramp area. The procurement began in 2022 and was scheduled to select the preferred bidder by the end of March 2023.[51] The Phoenix cargo P3 will finance, develop, and operate a new cargo complex on a 28-acre site. A November 2022 story noted that PHX hoped to award a contract by May 2023.[52]

49 Michael Bennon, "LaGuardia Terminal B Arrives On Time," *Public Works Financing*, August 2022.

50 Eugene Gilligan, "Connecticut City Board Supports Airport P3," *Inframation News*, 28 September 2022.

51 Eugene Gilligan, "LAWA Targets End of March for Cargo P3 Preferred Bidder," *Inframation News*, 7 March 2023.

52 Robert Poole, "Two U.S. Airports Pursuing Cargo Facility P3s," *Aviation Policy News*, November 2022.

A new airport terminal P3 project is underway at the Gulf Shores, Alabama airport. It is currently a general aviation airport, but the Gulf Shores Airport Authority sees tourism potential for the airport, which is an hour south of Mobile and an hour west of Pensacola, Florida. In September 2022, the Airport Authority signed a long-term concession agreement with TBI and Vinci Airports that includes building a temporary passenger terminal to be followed by a permanent terminal once the number of annual passengers reaches 75,000 (for design) and 135,000 (to begin construction).[53]

[53] Eugene Gilligan, "Alabama Airport Reaches Agreement with Vinci-Led Consortium," *Inframation News*, 7 September 2022.

PART 4

PUBLIC PENSION FUND INFRASTRUCTURE INVESTING

4.1 INTRODUCTION

The concept of public pension funds including infrastructure in their investment portfolios is not new. Pension funds generally invest in relatively safe long-term bonds for a significant portion of their portfolios, as well as relatively conservative corporate stocks such as those of railroads and investor-owned utilities. But a great deal of U.S. infrastructure is owned by governments: airports, seaports, toll roads, and most municipal water and wastewater systems. Pension funds do not invest in these government-owned infrastructure assets for two reasons. First, these facilities' bonds are tax-exempt, and the tax exemption is of no value to nonprofit, tax-exempt public pension funds. Second, it is not possible to buy shares in government-owned infrastructure since there are no tradeable shares.

Unfortunately, U.S. public pension funds have made only limited commitments to infrastructure investment over the past decade, compared with their well-funded counterparts in Australia and Canada, which pioneered pension fund infrastructure investing. During fiscal year 2022, the median investment return for U.S. state pension funds was minus 5.2%. That compares with their median assumed long-term rate of return of 7%.[54]

Infrastructure investment opportunities are much greater today than 20 years ago because governments in many countries have leased or sold revenue-generating infrastructure. In some cases, such as the British airports, seaports, telecom systems, electricity utilities, and water systems, the government sold shares to the public or auctioned the entities to private sector investors. In a larger number of cases, governments created long-term P3 leases for such facilities, as is typically the case in Asia, Australia, and Latin America, as well as some European countries. The shares in the special purpose vehicles (SPVs) that win the long-term concessions for such infrastructure are generally not traded on stock markets (i.e., they are unlisted), but knowledgeable investors such as infrastructure investment funds and public pension funds can purchase portions of the SPVs' equity.

Infrastructure investment opportunities are much greater today than 20 years ago because governments in many countries have leased or sold revenue-generating infrastructure.

The pioneer pension funds investing in privatized infrastructure were those of Australia and Canada. An excellent account of the Canadian public pension system's transformation is a presentation by Keith Ambachtsheer of KPA Advisory Services.[55] He traces the reform of Canadian public pensions to Peter Drucker's 1976 book, *The Unseen Revolution*, about the huge potential impact of the pension sector if properly focused on serious long-term investment. In 1986, Ontario's treasurer, Robert Nixon, created a task force to study how that province's public pension system could be improved. Both Nixon and the head of the Ontario Teachers Federation, Margaret Wilson, followed the task force's suggestions, leading to enacting the 1990 Teachers' Pension Act. That legislation created the Ontario Teachers' Pension Plan with a charter of significant insulation from politics. OTPP's board

54 Zachary Christensen, Jordan Campbell, Steve Vu, and Anil Niraula, "The 2022 Fiscal Year Investment Results for State Pension Plans," Reason Foundation, 3 October 2022, updated 7 February 2023.

55 Keith Ambachtsheer, "How Peter Drucker Revolutionized Canada's Public Sector Pension System: Lessons for Americans," Harvard Law School Forum on Corporate Governance, 8 December 2022.

developed a strategy to build a substantial in-house investment capability, with a focus on private markets in equities, real estate, and infrastructure. Its early success led OTPP to becoming the model for reform in other provinces and at the national level. Ambachtsheer reports that five separate studies have found that "Canadian funds are better-funded, and have historically produced higher investment returns at lower risk levels" than counterparts in other major economies. They are also "materially better diversified through less exposure to public equities and greater exposure to inflation hedges such as real estate and infrastructure."

In 1992, the Australian government required employers to set aside 3% of nearly all employees' wages in their choice of approved pension funds. Over subsequent years, that annual percentage was gradually increased to 9.5%. The pension funds built diversified portfolios, including shares in Australia's newly privatized utilities, airports, seaports, toll roads, and other infrastructure. As of 2022, those pension funds had assets of $2.2 trillion, despite a down year.[56]

Most pension funds that invest in private and P3 infrastructure minimize their risk by not making direct investments in specific facilities.

Most pension funds that invest in private and P3 infrastructure minimize their risk by not making direct investments in specific facilities. Instead, they allocate a specific sum for infrastructure and place it with one or more infrastructure investment funds, such as those shown in Table 1. A handful of large Australian and Canadian pension funds have developed staffs with detailed knowledge and understanding of private and P3 infrastructure. Those funds make direct investments, in addition to placing some of their capital with major infrastructure funds. Also of note, the seventh-largest fund in Table 1—IFM Investors—was created by pension funds acting together to invest in infrastructure on behalf of their member beneficiaries.

[56] Amy Bainbridge and Matthew Burgess, "Australian Pension Funds Suffer Worst Performance in 14 Years," *Bloomberg*, 29 December 2022.

4.2 OVERSEAS PENSION FUND INFRASTRUCTURE DEVELOPMENTS IN 2022

Australian and Canadian pension funds with extensive infrastructure expertise remained very active in 2022. *Infrastructure Investor* featured Ontario Municipal Employees Retirement System (OMERS) in a 2022 feature article, citing its 20% allocation to infrastructure and its aim to increase that total to 25% by 2027.[57] And in a three-page Briefing article, *The Economist* quoted OMERS CEO Blake Hutcheson on his experience building the portfolio, "It always felt like low inflation and low interest rates were an aberration. We've been prepared for a day that looks like today."[58]

Some examples of 2022 transactions by Australian and Canadian pension funds include:

- **IFM Investors** and three Australian public pension funds—Uni Super, Q Super, and Australian Super—acquired the long-term P3 concession for Sydney Airport (Australia's largest) in 2022, for $16.58 billion.[59]
- **Canada Pension Plan Investment Board (CPPIB)** and **OMERS** decided in 2022 to sell their shares in the 99-year P3 concession of a toll road called the Chicago Skyway. The third shareholder, OTPP, opted to keep its shares. The winning bidder, Australian toll road manager Atlas Arteria, paid $2.1 billion for the two pension funds' two-thirds stake on the Skyway concession.[60] CPPIB and OMERS acquired five highway projects valued at $1.5 billion from infrastructure fund Brookfield.[61] CPPIB's Indinfravit Trust in July 2022 agreed to buy five P3 toll road concessions in India from Brookfield. CPPIB owns 44% of Indinfravit, along with OMERS and Allianz Capital Partners.[62]
- **OMERS** sold its 65.1% interest in Strait Crossing Development, Inc., which operates Canada's Confederation Bridge under a P3 concession expiring in 2032. Vinci

57 Zak Bentley, "OMERS Supersizes Its Infra Portfolio," *Infrastructure Investor*, July/August 2022.
58 Briefing, "The New Rules of Investment," *The Economist*, 10 December 2022.
59 Alexander MacLeod and Pablo Martinez, "Airport Transactions Cleared for Take-Off, but Expect Greater Scrutiny," *Inframation News*, 23 August 2022.
60 Michael Bennon, "Chicago Skyway Stake Acquired by Atlas Arteria for $2 Billion," *Public Works Financing*, September 2022.
61 Staff report, "Fund backed by CPPIB, OMERS Acquiring Indian Road Portfolio," Benefits Canada, *Canadian Investment Review*, 6 June 2022.
62 Lakshmi Iyer, "CPPIB-Backed Trust to Buy India Roads Portfolio from Brookfield," *Inframation News*, 13 July 2022.

Highways, the other owner of the concession, thereby increased its stake from 19.9% to 85%.[63]

- **CDPQ (Caisse de dépôt et placement du Québec)** acquired 50% of the A25 toll road concession in Montreal from Transurban for $264 million in early 2023. Transurban had acquired 100% of the 7.2 km toll road from Macquarie in 2018.[64]
- **OTPP** in 2014 acquired ownership of U.K.'s Bristol Airport by acquiring Macquarie's 50% stake. In January 2023 it was reported to be preparing a £160 million refinancing to pay down airport debt and prepare for additional investment. OTPP also has investments in Birmingham (U.K.) Airport and London City Airport. OTTP and CPPIB increased their stakes in Mexican toll road company IDEAL by investing $525 million; each now owns a 24.8% interest in IDEAL.[65]
- **Macquarie Asset Management, Aware Super, and Australian Retirement Trust** acquired a 40-year P3 concession for Victoria's Motor Registry (VicRoads) from the Victoria state government for $5.4 billion. The state's newly created Future Fund will receive the proceeds from the sale.[66]
- **IFM** received new commitments from several U.K. pension systems, while two others sold their stakes. New commitments to IFM's Global Infrastructure Fund came from the Shetland Islands Council Pension Fund, the British Maritime Technology Pension and Life Assurance Scheme, and the Highlands and Islands Enterprise Superannuation Scheme.[67] Selling their stakes in that IFM fund were the Royal National Lifeboat Institution and the West of England Ship Owners Mutual Insurance Association.[68] Earlier, it received two commitments to the fund from the East Sussex Pension Fund and the Northeast Scotland Pension Fund.[69]

4.3 U.S. PENSION FUND DEVELOPMENTS

The United States still has a long way to go to match the extent of public pension fund investments in infrastructure by Australian and Canadian pension funds. The large Canadian and Australian pension funds are all fully funded, which is far from true for the large

63 Press release, "OMERS Infra Exits Bridge Concession," *Inframation News*, 18 April 2022.
64 Shaun Drummond, "Transurban Agrees to Sell 50% of Montreal Road to CDPQ," *Inframation*, 6 February 2023.
65 Stock exchange filing, "Canadian Funds Increase Their Stake in Mexican Developer IDEAL," 16 June 2022.
66 Shaun Drummond, "Nineteen Banks in AUD7.9BN Sale of VicRoads Concession," *Inframation News*, 1 July 2022.
67 Andras Csillik, "UK Pension Schemes Back IFM Infra Fund," *Inframation News*, 25 October 2022
68 Attila Veszelovszky, "Pension Investors Sell IFM Infra Fund Stakes," *Inframation*, 1 February 2023.
69 Attila Veszelovszky, "IFM Raises Five Further Commitments," *Inframation News*, 18 July 2022.

majority of U.S. public pension funds. Colin Leopold notes that "Higher return-seeking U.S. pension funds are slowly shifting out of private equity-based fossil fuel investments, but they are still grossly under-allocated to infrastructure, compared to their Canadian or Australian peers (around 1%, compared to 7% or 8%)."[70] David Lebovitz of JP Morgan Asset Management suggests that a typical U.S. pension fund "should start off by allocating 5-10% of its assets to [property and infrastructure], with the share rising to 15-20% over time."[71]

As of 2022, there were still not many U.S. infrastructure investment opportunities for pension funds. Pension funds invest *equity* in infrastructure, but there is no equity available to purchase in government-owned and -operated airports, seaports, toll roads, or other revenue-generating infrastructure. So, when U.S. pension funds do allocate a small portion of their portfolios to infrastructure, they place it with one or more of the infrastructure investment funds like those in Table 1—and those funds invest mostly in non-U.S. infrastructure. It is the lack of more long-term P3 airports, seaports, toll roads, etc. that limits pension fund infrastructure investment in the United States. That could be changed by revising federal and state P3 policy to facilitate more long-term DBFOM concessions.

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The nation's largest public employee pension fund, **CalPERS**, was one of the first to invest in privatized and P3 infrastructure, with notable investments including stakes in London Gatwick Airport and the SPV for the Indiana Toll Road. In 2021, it committed just over $1 billion to the Golden Reef Infrastructure Trust, a separately managed account (SMA) within the **Queensland Investment Corporation (QIC)**, a pension fund of the Australian state government Queensland.[72] CalPERS set up the SMA with QIC in 2015, and prior to 2020 had committed $1.6 billion to it. CalPERS has also made commitments of $500 million to J.P.

70 Colin Leopold, "News Analysis: Infra Funds Listen for 'Big Bang' in Pension Allocations," *Inframation News*, 23 September 2021.

71 Buttonwood, "Do Physical Assets Offer Investors Refuge from Inflation?" *The Economist*, 11 September 2021.

72 Yuanqing Sun, "CalPERS Commits USD 1BN to QIC-Managed Account," *Inframation News*, 14 September 2020.

Morgan Infrastructure Investment Fund, $300 million to Alinda Infrastructure Fund II, $300 million to North Haven Infrastructure Partners, and $250 million to ArcLight Energy Partners Fund IV, among others.

As noted previously in this report, 2022 was a difficult year for the large majority of U.S. state and local public pension funds. A year-end article on public and private pension funds in *The Economist* noted that the average U.S. *corporate* pension fund was fully funded by year-end, for the first time since 2007. By contrast, the article noted, "The big losers of 2022, though, are public pensions. Whereas over the past 12 months the average funding ratio for a private plan has risen from 97% to around 110%, that of public pensions in America, which stood at 86% a year ago, their highest since the financial crisis, has dropped to 69%—close to a four-year low."[73]

A number of state and local public pension funds made or increased commitments to infrastructure investment during 2022, aiming to increase the overall return on their investments. Here is an illustrative selection:

- In January 2022 the Stanislaus County (California) Employees' Retirement Association committed $20 million to Melody Communications Infrastructure Fund II. In November 2020 its board increased its private infrastructure target from 2% to 7.5%. In 2021 it allocated $80 million to IFM Global Infrastructure Fund and JP Morgan Infrastructure Investments Fund. Also in January, the Gainesville (Florida) Police and Fire Pension Plan committed $15 million to Harrison Street Social Infrastructure Fund.[74]
- Also in January, two California pension plans—Los Angeles County Employees Retirement Association (LACERA) and Alameda County Employees' Retirement Association (ACERA)—made new infrastructure commitments. LACERA will commit $1.4 billion per year over the next five years to reach its 5% infrastructure target by 2026. It already had invested in infrastructure funds from Antin, DIF, and KKR. ACERA will commit up to $30 million to a Tiger Infrastructure Partners fund. ACERA has previously acquired positions in funds from EQT and Brookfield.[75]
- In February, the Arkansas Teachers Retirement System committed up to $50 million to ISQ Global Infrastructure Fund III. Its planned allocation to infrastructure for 2022 was $75 million. Also, the Texas Municipal Retirement System made its first

73 "Pension Funds: The Incredible Shrinking Plan," *The Economist*, 10 December 2022.

74 Bianca Giacobone, "Weekly Commitments: Melody, Harrison Street," *Inframation News*, 28 January 2022.

75 Bianca Giacobone, "Weekly Commitments: Tiger Infrastructure, LACERA," *Inframation News*, 14 January 2022.

infrastructure commitment, with $200 million targeted to Oaktree Power Opportunities Fund VI.[76]

- Another public pension system, the Connecticut Retirement Plans and Trust Funds, announced that it was considering a commitment of up to $100 million to Tiger Infrastructure Partners Fund III as an addition to the plan's Real Asset Fund. CRPTF already had investments in ISQ Global Infrastructure Fund III and Stonepeak Infrastructure Fund IV.[77]
- In May, the State Universities Retirement System (SURS) of Illinois board made a $100 million commitment to IFM Global Infrastructure Fund. Previous commitments include Ember Infrastructure Fund I and Pantheon Global Infrastructure Fund IV.[78]
- In June, the State of Connecticut Retirement Plans and Trust Funds said it was considering increasing its allocation to infrastructure and natural resources from 4% to 7% in the long term. The system manages a $42 billion portfolio.[79]
- In December, the Teachers Retirement System of the State of Illinois (TRS) approved committing $150 million to Macquarie Infrastructure Partners VI. Previous TRS infrastructure investments include funds from Brookfield, KKR, and Stonepeak. And the Arkansas Teachers Retirement System (ATRS) committed $52 million to DIF Infrastructure VII, a relatively new DIF fund focused on P3 concessions and utilities, energy, and renewables. Other ATRS infrastructure investments include funds managed by ISQ, KKR, and Macquarie.[80]

The selected news items above are intended to illustrate the range of U.S. public pension funds investing in infrastructure, ranging from small and large cities and counties to statewide entities. Even the employee retirement systems of relatively small municipal governments are embracing infrastructure investment as a means of increasing their overall return on investment, along with large-city and state retirement systems. But given the poor 2022 performance of the majority of U.S. public employee retirement systems, they have a long way to go to achieve the successful records of Canadian and Australian systems.

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76 Bianca Giacobone, "Weekly Commitments: I Squared, Oaktree," *Inframation News*, 11 February 2022.

77 Bianca Giacobone, "Weekly Commitments: Fresno Looks for Non-Core Manager," *Inframation News*, 18 February 2022.

78 Bianca Giacobone, "Illinois Pension Makes USD 100M Open-Ended Fund Commitment," *Inframation News*, 6 May 2022.

79 Bianca Giacobone, "Two Pension Plans Increase Infra Commitment Target," *Inframation News*, 17 June 2022.

80 Andras Csillik, "Weekly Commitments: Macquarie, DIF, IFM, Stonepeak, GIP," *Inframation News*, 9 December 2022.

ABOUT THE AUTHOR

Robert W. Poole, Jr. is founder and former president of Reason Foundation, a national public policy think tank based in Los Angeles. He is nationally known as an expert on privatization and transportation policy.

During the 1970s he worked as a consultant on state and local public service delivery for several California-based research firms. He was the first person to use the term "privatization" to refer to the contracting-out of public services. His 1976 booklet on contracting-out municipal services led to a book contract for what became the first-ever book on privatization, *Cutting Back City Hall*, published by Universe Books in 1980.

He launched Reason Foundation in 1978 as a think tank dealing with public policy issues, including privatization. It took over publication of his newsletter, *Fiscal Watchdog*, later renamed *Privatization Watch*—the first-ever newsletter on privatization. Under Reason's auspices, he conceived and edited three books: *Instead of Regulation* (1982), *Defending a Free Society* (1984), and *Unnatural Monopolies* (1985), all published by D.C. Heath/Lexington Books. With Virginia Postrel, he edited *Free Mind & Free Markets: 25 Years of Reason* (Pacific Research Institute, 1993). His book *Rethinking America's Highways* was released by the University of Chicago Press in 2018.

During the Reagan years he consulted on privatization with the White House Office of Policy Development, and he testified before the President's Commission on Privatization. He worked with the Bush White House on what became Executive Order 12803 on infrastructure privatization. During the Clinton years he advised Vice President Gore's National Performance Review and the White House National Economic Council on privatization issues. In 2000–2001 he was a member of the Bush-Cheney transition team on transportation policy. He is a member of the boards of Reason Foundation, and the Public-Private Partnerships division of the American Road & Transportation Builders Association. He is also a member of the Transportation Research Board's P3 Subcommittee and a former member of its Managed Lanes Committee.

He is the author of dozens of policy studies and journal articles on transportation issues. His popular writings have appeared in national newspapers, including *The New York Times* and *The Wall Street Journal*; he has also been a guest on such network TV programs as "Crossfire," "Good Morning America," and "The O'Reilly Factor," as well as ABC and NBC News.

He received his B.S. and M.S. in mechanical engineering at MIT and did graduate work in operations research at NYU.