

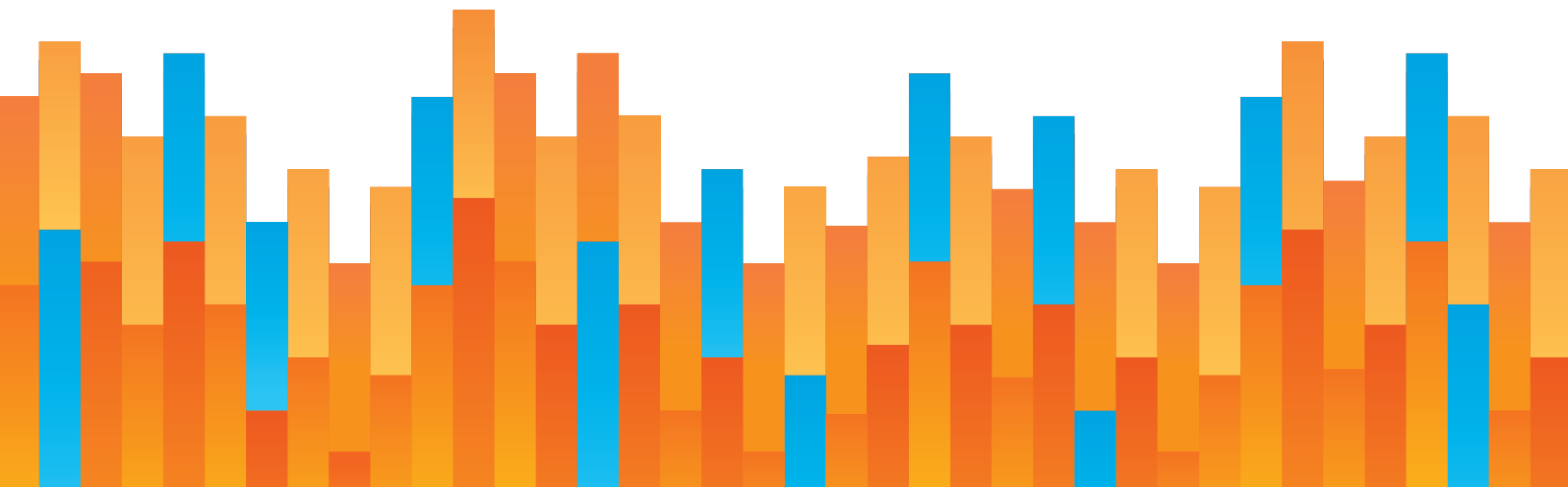


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ANNUAL PRIVATIZATION REPORT 2024: TRANSPORTATION FINANCE

by Robert W. Poole, Jr.

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PART 1

INTRODUCTION

Worldwide over the past three decades, governments have turned to the private sector to design, build, finance, operate, and maintain infrastructure, including electric, gas, and water utilities; airports, seaports, and toll roads; and pipelines and telecommunications providers. In many cases, existing infrastructure entities needing reconstruction or modernization were “privatized” via either outright sale or long-term leases. For new infrastructure, governments awarded long-term design-build-finance-operate-maintain (DBFOM) concessions via a competitive process. These long-term public-private partnerships (P3s) had terms typically between 30 and 50 years. The sale or lease of an existing facility is referred to as a “brownfield” transaction, while a P3 to develop and operate a new facility is a “greenfield” transaction.

While the United States still lags behind many countries in Europe, Asia/Pacific, and Latin America/Caribbean, this difference arises in part because in the United States much infrastructure that was state-owned and operated in Europe and other regions was historically investor-owned in the U.S.—such as telecommunications, electric and gas utilities, pipelines, and a fraction of water and wastewater utilities. On the other hand, major transportation infrastructure such as airports, seaports, and toll roads that have been widely privatized in Europe, Asia/Pacific, and Latin America/Caribbean countries are still mostly government-owned and operated in the United States.

Both brownfield and greenfield infrastructure projects require long-term financing. Facilities owned and operated by governments are often financed 100% by government

revenue bonds or general-obligation bonds, which in the United States are exempt from federal taxation. When the private sector invests in infrastructure, it typically invests equity to cover part of the cost and finances the rest via long-term revenue bonds. To level the financial playing field for U.S. P3s, Congress provided for tax-exempt private activity bonds (PABs), which are now widely used for such projects.



... major transportation infrastructure such as airports, seaports, and toll roads that have been widely privatized in Europe, Asia/Pacific, and Latin America/Caribbean countries are still mostly government-owned and operated in the United States.



The large financing needs for privately financed infrastructure have led to the development and growth of infrastructure investment funds, which raise equity to be invested in privately owned or P3 infrastructure. Public-sector pension funds, seeking to increase the overall return on their investments, are also making significant equity investments in revenue-generating infrastructure. Likewise, insurance companies and sovereign wealth funds are now making long-term investments in this kind of revenue-generating infrastructure.

This report reviews 2023 developments in private/P3 infrastructure investment, focusing on transportation infrastructure. While the report's scope is global, it pays particular attention to U.S. developments in P3 infrastructure and the continued growth in pension fund investment in this field. Part 2 reviews the continuing growth of infrastructure investment funds worldwide. Part 3 provides an update on the largest companies and major P3 projects under way globally and in the United States. Part 4 then reviews pension funds' increasing investment in revenue-generating infrastructure.

PART 2

MAJOR INFRASTRUCTURE INVESTMENT FUNDS AND TRENDS

2.1 OVERVIEW OF INFRASTRUCTURE FUNDS

Each year *Infrastructure Investor* publishes a table of the amounts raised by the largest infrastructure funds over the latest five-year period. Originally covering the largest 50 funds, in 2021 the tally was changed to the top 100. Table 1 lists the 2023 top 100 funds and five-year total each had raised by autumn 2023. For the first time, the total exceeds \$1 trillion.

TABLE 1: INFRASTRUCTURE INVESTOR TOP 100 FUNDS, 2023

Rank	Fund Manager	HQ	Sum Raised (\$M)
1	Macquarie	Australia	\$93,302
2	Brookfield	Canada	\$86,590
3	Global Infra. Partners	USA	\$69,034
4	KKR	USA	\$67,891
5	EQT	Europe	\$50,432
6	Stonepeak	USA	\$45,711
7	DigitalBridge	USA	\$40,488
8	Blackstone	USA	\$31,765
9	Antin	Europe	\$26,149
10	IFM Investors	Australia	\$25,517

Rank	Fund Manager	HQ	Sum Raised (\$M)
11	I Squared	USA	\$24,673
12	Copenhagen Infra.	Europe	\$24,065
13	BlackRock	USA	\$23,140
14	Ardian	Europe	\$20,000
15	ECP	USA	\$14,616
16	DIF	Europe	\$14,191
17	Igneo	Australia	\$13,347
18	Partners Group	Europe	\$13,231
19	Meridiam	Europe	\$12,004
20	Equitix	Europe	\$9,320
21	Swiss Life	Europe	\$9,202
22	Actis	Europe	\$8,645
23	Morgan Stanley	USA	\$8,629
24	InfraVia	Europe	\$8,490
25	Vauban	Europe	\$8,293
26	Schroders	Europe	\$7,414
27	AIP Management	Europe	\$7,205
28	EnCap	USA	\$7,065
29	InfraRed	Europe	\$6,992
30	Basalt	Europe	\$6,866
31	GCM Grosvenor	USA	\$6,578
32	QIC Limited	Australia	\$6,537
33	F2i	Europe	\$6,490
34	Carlyle Group	USA	\$6,410
35	Apollo Global	USA	\$5,941
36	AXA	Europe	\$5,617
37	ICON*	Europe	\$5,607
38	Manulife	USA	\$5,575
39	National Investment	Asia	\$5,490
40	Axium	Canada	\$5,485
41	Infracapital	Europe	\$5,457
42	Grain Management	USA	\$5,340
43	IPI Partners	USA	\$5,311
44	Goldman Sachs	USA	\$5,249
45	Energy Infra, Partners	Europe	\$5,114
46	Oaktree	USA	\$4,781
47	Mexico Infra Partners	Latin Amerca	\$4,713
48	Luxcara*	Europe	\$4,546
49	Asterion	Europe	\$4,513
50	Argo Infra Partners	USA	\$4,494
51	Capital Dynamics	Europe	\$4,420
52	DWS	Europe	\$4,264

Rank	Fund Manager	HQ	Sum Raised (\$M)
53	Northleaf	Canada	\$4,250
54	LS Power	USA	\$4,250
55	Generate Capital	USA	\$4,031
56	Ullico	USA	\$3,987
57	ArcLight	USA	\$3,955
58	GI Partners	USA	\$3,946
59	Foresight Group	Europe	\$3,820
60	Allianz Global	Europe	\$3,812
61	Quinbrook	Europe	\$3,711
62	Dalmore Capital	Europe	\$3,702
63	Morrison & Co.	New Zealand	\$3,590
64	Ancala Partners	Europe	\$3,525
65	CIM Group	USA	\$3,456
66	Cube Infra.	Europe	\$3,450
67	Ares Management	USA	\$3,284
68	Omnes Capital	Europe	\$3,122
69	GLIL Infra.	Europe	\$3,052
70	Mirova	Europe	\$3,049
71	Aquila Capital	Europe	\$3,017
72	Glennmont Partners*	Europe	\$2,971
73	JP Morgan Asset Mgt.	USA	\$2,955
74	Qualitas Energy	Europe	\$2,940
75	Patria Investments	Latin Amerca	\$2,906
76	Arcus Infra Partners	Europe	\$2,761
77	NextEnergy Capital	Europe	\$2,743
78	Vision Ridge Partners	USA	\$2,704
79	Arjun Infra Partners	Europe	\$2,589
80	Harrison Street*	USA	\$2,530
81	ESR Group*	China	\$2,443
82	Amber Infra Group	Europe	\$2,441
83	Fengate Asset Mgt.*	Canada	\$2,368
84	3i Group	Europe	\$2,318
85	Pacific Equity Partners*	Australia	\$2,252
86	China Intl. Capital	China	\$2,175
87	DTCP*	Europe	\$2,154
88	Tiger Infra Partners	USA	\$2,141
89	Palistar Capital	USA	\$2,119
90	Tailwater Capital*	USA	\$2,117
91	Hy24	Europe	\$2,106
92	Keppel Capital*	Asia	\$2,100
93	Patrizia	Europe	\$2,071
94	Sustainable Development	Europe	\$2,006

Rank	Fund Manager	HQ	Sum Raised (\$M)
95	Intermediate Capital	Europe	\$1,934
96	Commerz Real*	Europe	\$1,893
97	Instar Asset Mgt.	Canada	\$1,691
98	Marguerite*	Europe	\$1,670
99	Hull Street Energy*	USA	\$1,625
100	Astatine Invest. Partners	USA	\$1,597
			\$1,037,528

* designates a fund not in the 2022 top 100

Source: *Infrastructure Investor*, November 2023 (<https://infrastructureinvestor.com/how-infra-became-a-1trn-asset-class>)

As the table shows, these infrastructure investment funds are based in many countries, but as in previous years, Europe and the United States represent the lion's share. Table 2 provides the geographical breakdown.

TABLE 2: HEADQUARTERS LOCATION OF TOP 100 INFRASTRUCTURE INVESTORS

United States	\$427.388 billion	41.2%
Europe	\$345.384 billion	33.3%
Australia/New Zealand	\$144.545 billion	13.9%
Canada	\$100.384 billion	9.7%
Latin America/Caribbean	\$7.619 billion	0.7%
Asia except China	\$7.590 billion	0.7%
China	\$4.618 billion	0.4%
Total	\$1,037.528 billion	99.9%*

Source: *Infrastructure Investor*, November 2023

*Percentages do not add to 100% due to rounding.

The order in Table 2 is similar to last year's percentages, but U.S. funds have increased their lead over European funds, going from 40.8% in 2022 to 41.2% in 2023, while second-place Europe decreased from 39.9% to 33.3%. Australia/New Zealand was third in 2023 (at 13.9%), displacing Canada which slipped to fourth place at 9.7%. Latin America/Caribbean slightly edged out Asia, and China dropped into last place.

For those U.S. elected officials who may worry about "foreign companies buying up American infrastructure," the data in Table 2 should be reassuring. The vast majority of infrastructure investment fund capital is being raised from U.S.-headquartered funds or funds based in the U.K., the European Union, Canada, or Pacific allies Australia and New

Zealand. Together, they amount to 98% of the total raised and being invested in U.S. and other countries' infrastructure. China's share, at 0.4%, is equivalent to a rounding error.

While the five-year numbers are impressive, fund-raising by infrastructure investment funds was 35% less in 2023 than in 2022. *Infrastructure Investor* reports that "Only \$112 billion was raised by closed-end structures last year compared with a new high of \$172 billion in 2022."¹ *Infralogic* noted that "record fourth-quarter activity helped fund-raising recover from [what would have been] a nine-year low."² It also noted that many investors are waiting to see how interest rates develop in 2024.

Infralogic analyst Attila Veszelszky reports that infrastructure investment funds finished 2023 with \$1.67 trillion in assets under management (AUM). That is about double the comparable figure of \$820 billion the company provided for last year's edition of this report. The explanation is that funds and limited partners have been focusing on updating this information more systematically, so the prior year's figure was likely a considerable under-estimate.³ *The Economist* cited a somewhat lower AUM estimate from data firm Preqin of \$1.3 trillion in AUM at year-end.⁴

Despite the much larger total of assets under management, 2023 also saw very little change in "dry powder"—funds raised but not yet invested. The end-2023 total of \$375.73 billion in "dry powder" is comparable to the 2022 total of \$380 billion.⁵

Table 3 provides a breakdown of 2023 P3 infrastructure investment by sector. As can be seen, transportation was again the largest category, at \$51.781 billion, representing 62% of the investment and 65% of the projects. In 2022, the transportation total was double that, at \$108.359 billion, representing 72% of the investment and 64% of the projects.

¹ News release, "Fund-Raising Drops by 35% in 2023," *Infrastructure Investor*, 31 January 2024.

² Pablo Martinez, "2023 Fund-Raising Report: Scrutiny Intensifies as Managers Miss Targets," *Infralogic*, 22 January 2024.

³ Attila Veszelszky, email from Giulio Comellini of *Infralogic* to Robert Poole, 6 February 2024.

⁴ Schumpeter, "Rock Solid: Why BlackRock Is Betting Billions on Infrastructure," *The Economist*, 20 January 2024.

⁵ Veszelszky, email to Robert Poole.

TABLE 3: 2023 P3 INFRASTRUCTURE INVESTMENT BY SECTOR

Sector	Value (\$M)	% of Total	Number	% of Total
Transportation	\$51,781	62%	205	65%
Social	\$15,371	18%	61	19%
Environment	\$12,761	15%	30	10%
Energy	\$2,061	2%	6	2%
Power	\$1,397	2%	4	1%
Telecoms	\$448	1%	5	2%
Renewables	\$210	0%	2	1%
Other	\$99	0%	1	0%
Total	\$84,128		314	

Source: Infralogic, data analysis for Reason Foundation, January 2024

2.2

ACQUISITIONS AND DIVESTITURES

Many infrastructure investment funds are “closed-end”—which means they are set up to acquire and manage a portfolio of infrastructure projects for a set period of time—most often 10 years. Other models include longer-term closed-end funds and open-ended funds, which are more like mutual funds offered by companies such as Fidelity and Vanguard.



Regardless of the structure of an infrastructure fund, it has an interest in maximizing value for its investors, which may include long-term investors such as insurance companies and public-sector pension systems.



Regardless of the structure of an infrastructure fund, it has an interest in maximizing value for its investors, which may include long-term investors such as insurance companies and public-sector pension systems. Therefore, at various times in an infrastructure fund’s life, it will sell some holdings to realize increases in value (or divest others that have not done well) and acquire other holdings in hopes of creating a more diversified portfolio. This is not short-term “asset-flipping” as sometimes observed in rising housing markets. It is an ongoing process that seeks to optimize the performance of each fund.

Below are some 2023 examples of such transactions by various members of the Infrastructure Investor 100 and one significant newcomer.

Macquarie Capital (#1 in Table 1) sold a majority stake in the RV555 toll road, the largest P3 project in Norway. The buyer was infrastructure developer John Laing (which is owned by KKR, #4 in Table 1).⁶ The toll road was valued at €2 billion at the time of financial close in 2022. Macquarie will continue to have a role in the P3 project during the toll road's construction, estimated to be complete in 2027. *Inframation* notes that "Selling down its equity stake in a PPP during construction is a strategy that Macquarie has used in the past."

Global Infrastructure Partners (#3 in Table 1) early in January 2024 agreed to be acquired by Blackrock (#13) for \$12.5 billion.⁷ The GIP team will become part of an expanded Blackrock, with five of its six founding partners joining Blackrock.

Ardian (#14 in Table 1) bested Macquarie (#1) for the 25% ownership stake in London Heathrow Airport offered by P3 developer Ferrovial. The price is estimated at £2.3 billion. Two other shareholders are also considering sales of their stakes: pension system CDPQ (12.6%) and GIC (11.2%). Ardian has Saudi Arabia's Public Investment Fund as a co-investor for the deal, and in December they were considering acquiring the CDPQ and GIC shares, as well.⁸

Global Infrastructure Partners (GIP) (#3 in Table 1) joined with French infrastructure developer Vinci to seek to acquire two toll roads in India—Solapur Tollways in Maharashtra and Vindhyachi Expressway in Madhya Pradesh. GIP and Vinci are both investors in London Gatwick Airport. One of the toll roads is not yet completely built, while the other has been in operation since 2015.⁹

IFM Investors (#10 in Table 1) acquired another 2% interest in publicly traded Atlas Arteria, the operator of toll roads in three countries: two in France (APRR and ADELAC), one in

⁶ Nick Roumpis, "John Laing Buys Majority Stake in Norwegian PPP," *Inframation*, 4 April 2023.

⁷ Jack Pitcher, "Blackrock Makes \$12.5 Billion Deal for Global Infrastructure Partners," *The Wall Street Journal*, 13 January 2024.

⁸ Brendan Malkin, "Ardian's Heathrow Deal Subject to Tag-Along Rights Compliance," *Infralogic*, 29 November 2023.

⁹ Rouhan Sharma, "GIP and Vinci Jointly Evaluate Two India Highway Acquisitions," *Inframation*, 3 August 2023.

Germany (Rostok Tunnel), and two in the United States (Chicago Skyway and Dulles Greenway). The transaction brought IFM's ownership of Atlas Arteria to just under 24%.¹⁰

F2i (#33) and **Ardian (#14)** completed refinancings totaling \$660 million of their Italian airport operators, 2i Airports and its subsidiary GESAC.¹¹ The latter operates Naples International Airport under a P3 concession that expires in 2045. 2i Airports includes stakes in both Milan airports (Linate and Malpensa) and airports in Bologna, Sardinia, Trieste, and Turin. Ardian and investor Credit Agricole Assurances are also reportedly considering selling their stake in 2i Aeroporti, with an estimated value of €2.5 billion.

Meridiam (#19 in Table 1) agreed to sell a 20% stake in the investment fund to Samsung Life Insurance of South Korea, as part of a capital increase to fund expanded operations.¹² Meridiam's 40 partners will retain the other 80%. The proceeds will be used to support growth of its existing funds as well as new strategies. Samsung Life has been a debt provider to some previous Meridiam projects.

DIF Capital Partners (#16 in Table 1) announced plans to sell its stake in the Northwest Parkway toll road in the Denver, Colorado metro area.¹³ Other shareholders in the toll road are Infrared (#29), Northleaf (#53) and Danish pension system Industriens Pension. Earlier in the year, HICL Infrastructure (managed by Infrared) sold a 30% stake in the toll road concession to an "undisclosed buyer" for \$86 million.

Apollo Global Management (#35 in Table 1) is working with Starboard Partners to create a highway investment platform consisting of brownfield concessions. The fund recently won a concession for the São Paulo, Brazil Rodonael Norte ring road P3. Initially Starboard's highway platform will be focused on São Paulo projects.¹⁴

Goldman Sachs (#44 in Table 1) has hired RBC to explore options for the two airport companies it owns: Aviation Facilities Company (AFCO) and Avports. AFCO develops and manages airport facilities, while Avports is a developer/operator of small and mid-size U.S. airports. Goldman Sachs' West Infrastructure Partners III acquired the companies in 2018.

¹⁰ Lakshmi Iyer, "IFM Investors Buys Another 2% Stake in Atlas Arteria," *Infralogic*, 8 November 2023.

¹¹ Antonio Fabrizio, "F2i, Ardian Complete EUR 660m Italian Airports Debt Deals," *Infralogic*, 23 November 2023.

¹² Antonio Fabrizio, "Meridiam Inks Deal with Samsung Life as Minority Investor," *Inframation*, 5 April 2023.

¹³ Matt O'Brien and Jonathan Carmody, "DIF Launches Auction for Stake in Colorado's Northwest Parkway," *Infralogic*, 27 October 2023.

¹⁴ Gabriela Valente, "Starboard Partners Targets M&A to Create Highway Platform," *Inframation*, 25 April 2023.

Infralogic reports that Goldman’s decision to hire an advisor “was in part due to a growing interest in the businesses from both strategic and financial sponsors.”¹⁵

DWS Infrastructure (#52 in Table 1) received a bid for the majority stake it and InfraVia Capital Partners (#24) hold in Venice (Italy) airport company SAVE.¹⁶ The bid came from investor Enrico Marchi, president of SAVE.

AP Moller Capital is buying an Indonesian toll road. The relative newcomer to infrastructure investment is seeking to acquire CTP Tollways from state-owned Pelindo. The state owner aims to sell 70%–75% of the asset, which links Indonesia’s largest port to industrial parks and logistics firms on the east side of Jakarta. AP Moller Capital is part of global transport company AP Moller Group. It is also planning to launch an Asia and Africa infrastructure investment fund, the Emerging Markets Infrastructure Fund II, aiming to raise \$1.2–1.5 billion.¹⁷

2.3

CRITIQUE OF INFRASTRUCTURE INVESTMENT FUNDS

The year 2023 saw the release of a book-length critique of infrastructure privatization and P3s: *Our Lives in Their Portfolios: Why Asset Managers Own the World*, by Brett Christophers, Verso, 2023. It’s a broad-based attack on the infrastructure investment industry. Christophers is a professor of human geography at Uppsala University in Sweden.

“

The year 2023 saw the release of a book-length critique of infrastructure privatization and P3s: Our Lives in Their Portfolios: Why Asset Managers Own the World...

”

¹⁵ Eugene Gilligan and Jonathan Carmody, “Goldman Mandates RBC to Review Options for Airports Businesses,” *Infralogic*, 3 November 2023.

¹⁶ Stefano Berra and Brendan Malkin, “Italian Exec Planning Infra Fund to Target Venice Airport,” *Infralogic*, 30 November 2023.

¹⁷ Tanu Pandey, “AP Moller Capital Enters Exclusivity to Buy Indonesian Toll Road,” *Inframation*, 14 September 2023.

A review of the book in *The Economist* called it “a lively account of the trend, but a muddled account of its costs.”¹⁸ Summarizing the book’s thesis, the review quotes Christophers as writing that asset managers are “relentless in squeezing maximum profits” from their assets. Such funds are said to cut costs, skimp on investment, and raise rents whenever they can get away with it... . They promise long-term stewardship when buying vital infrastructure, then sell with “unseemly haste” to reap quick profits. He also states that asset managers’ “product is snake-oil, and their utopia is pure moonshine.” (This is not exactly an academic research paper!)

The review also points out the author’s cherry-picking a handful of cases of failed asset sales and long-term P3 leases. But as Michael Bennon points out in a much longer review in *Public Works Financing*,¹⁹ these occasional failures reflect poor negotiation of the deals by several governments, such as the city of Chicago’s widely criticized parking meter P3 and the Bayonne, New Jersey water system P3 concession. Chicago, Bennon points out, had not increased parking meter rates for decades, but raised them significantly as part of the P3. Both cities also provided much-criticized minimum-revenue provisions in their P3 agreements. “Surely other bidders would have taken the deal without any compensation mechanism,” Bennon notes. And as for Bayonne, “there was another bidder right behind [winner] KKR, ready to pay \$150 million up-front plus \$157 million in capex . . . all without a revenue guarantee.”

Bennon also identifies the core argument of the book: that “short-termism is a structural part of infrastructure investment by asset managers,” which leads to things like underinvestment in improvements and skimping on maintenance. Author Christophers supports his claim by citing the common use of closed-end infrastructure funds, typically of 10 years’ duration. Reviewer Bennon calls this the lynchpin of the book. He acknowledges the large number of closed-end funds, but points out that “many investors [in long-term P3s] are strategic investment arms of [P3 developers], direct investment arms of institutional investors, or more ‘permanent’ capital funds without a fixed term.”

Bennon also questions the premise that the requirement for some investors to sell after 10 years discourages capital investment. “If the current owner doesn’t value the investment, why wouldn’t their buyer?” And he adds, “In P3s, any concerns regarding underinvestment

¹⁸ “Asset Managers Control a Growing Share of Society’s Essentials,” *The Economist*, 27 April 2023.

¹⁹ Michael Bennon, “PWF Book Review: Our Lives in Their Portfolios,” *Public Works Financing*, September 2023.

have tried and true solutions, including hand-back requirements and mandatory capex requirements.”

Moreover, he compares incentives for proper stewardship in a long-term P3 with the alternatives: “A mayor with a four-year term? A publicly traded corporation reporting quarterly to shareholders? The voting public?” And he adds, “one of the main arguments in favor of the P3 procurement model in infrastructure is that it *extends* the maintenance planning horizon beyond the annual maintenance budget request of the relevant public agency.”

Despite all of Bennon’s valid critiques, he lets the author off too easily, calling the book “as meticulous a view of the industry as has been provided by a skeptic.” Given Christophers’ later endorsement of widespread expropriation of privatized industries in the U.K. “at prices which might be below market prices,” the book could more accurately be described as a polemic.

Nevertheless, Bennon’s advice that the book should be mandatory reading for members of the asset management industry is well-taken. Long-term P3s are still not well-understood by most elected officials, news media, and the general public. Infrastructure investors should be prepared to defend their industry against the misleading claims set forth in this book.

PART 3

P3 COMPANIES AND PROJECTS

3.1 GLOBAL COMPANIES AND PROJECTS

During 2023 infrastructure investors financed \$84.128 billion worth of P3 infrastructure transactions, including transportation projects. While Table 3 in Part 2 provided a breakdown by the kind of infrastructure (transportation, energy, etc.), Table 4 shows the type of transaction, such as greenfield, brownfield, and other categories. Greenfield projects, a main focus of this report, constituted \$45.67 billion—54% percent of the 2023 total. Last year's figure was 53% greenfield, but the total was considerably larger, at \$72.586 billion.

TABLE 4: GLOBAL INFRASTRUCTURE P3 TRANSACTIONS BY TYPE, 2023

Type	Value (\$M)	% of Total	Number	% of Total
Greenfield	\$45,670	54%	140	45%
Refinancing	\$20,537	24%	74	24%
M&A	\$9,124	11%	52	17%
Additional	\$8,574	10%	47	15%
Nationalization	\$223	1%	1	0%
Totals:	\$84,128		314	

Source: Infralogic, data analysis for Reason Foundation, January 2024

Table 5 lists the 15 largest transportation projects financed in 2023. The first is the only

brownfield concession: the \$3 billion lease of four existing toll roads in Puerto Rico by Abertis, which already held the concession to operate, upgrade, and maintain several existing toll facilities there. Overall, highway projects (including bridges and tunnels) accounted for 51.7% of the funding of these projects, with urban rail transit in second place at 33.7% of the expenditure. Ports were next with two projects accounting for 10.3%, and one project in the airports sector accounted for 4.3% of the financing.

TABLE 5: 15 LARGEST P3 TRANSPORTATION PROJECTS FINANCED IN 2023

Country	Project	Sector	Value \$B	Lead Developers
USA	Puerto Rico Toll Roads	Highway	\$3.030	Abertis
Israel	Tel Aviv LRT (Light Rail Transit) Green Line	Rail Transit	\$1.919	Alstom, Dan, Electra
Israel	Tel Aviv LRT Purple Line	Rail Transit	\$1.363	CAF, Shapir
Norway	E10/RV85 Highway	Highway	\$1.067	Skanska
S. Korea	Dongbu Expressway	Highway	\$0.802	Macquarie, KDB
Sri Lanka	Colombo Container Terminal	Port	\$0.700	Adani, Keels
Colombia	Ruta al Sur	Highway	\$0.694	Colpatria
Egypt	Damietta Port	Port	\$0.655	Contship Italia, EUROGATE
Colombia	Via 40 Third Lane	Highway	\$0.636	Concreto, Vinci
Canada	Ile-Aux Tourte Bridge Replacement	Highway	\$0.567	Demathieu & Bard, Dragados
India	Bhogapuram Airport	Airport	\$0.566	GMR Infrastructure
Poland	Krakow Fast Tram	Rail Transit	\$0.437	Gulermak
Greece	Northern Road	Highways	\$0.370	Aktor, Intrakat, TERNA
Australia	Canberra LRT	Rail Transit	\$0.360	Aberdeen, John Holland
USA	MTA Station Accessibility	Rail Transit	\$0.350	ASTM

Source: Infralogic, data analysis for Reason Foundation, January 2024

Table 6 lists the world's largest transportation P3 developers, ranked by the number of DBFOM projects each has in operation or under construction. Some projects are developed by a consortium of two or more companies, so if, for example, Cintra and Meridiam collaborated on a project, it would be included in the project total for each of them. Hence, the numbers of projects should not be added together. Projects counted in Table 6 include highway, railway, airport, seaport, and ancillary projects costing \$50 million or more.

TABLE 6: WORLD'S 20 LARGEST TRANSPORTATION P3 DEVELOPERS

Company	Projects	US	Canada	Home Country	Other
Vinci (France)	58	6	3	22	27
Meridiam (France)	54	10	2	6	36
Sacyr (Spain)	43	0	0	16	27
ACS Group (Spain)	43	6	11	17	9
Macquarie (Australia)	39	6	0	5	28
Abertis (Spain)	37	3	0	6	28
Ferrovial/Cintra (Spain)	29	7	3	4	15
ASTM/Itinera (Italy)	25	0	0	13	12
Transurban (Australia)	24	3	1	20	0
Invesis (Netherlands)	20	0	0	6	14
Aleatica (Spain)	20	0	0	5	15
John Laing (U.K.)	15	6	1	1	7
Plenary (Australia)	16	6	6	4	0
FCC (Spain)	13	0	0	11	2
Balfour Beatty (U.K.)	13	1	0	12	0
Fluor (US)	9	5	0	5	4
Skanska (Sweden)	8	2	0	0	6
Acciona (Spain)	8	0	1	3	4
Shikun & Binui (Israel)	8	3	0	4	1
SNC-Lavalin (Canada)	7	0	6	6	1

Source: "World's Largest Transportation Developers: 2023 Survey of Public-Private Partnerships," *Public Works Financing*, January 2024

As in previous years, companies headquartered in Europe totaled 14 out of the 20 developers in Table 6—70% of the total. This should not be surprising, since the DBFOM P3 model originated in Europe dating back to the 1970s. And Australia, despite its relatively small size, also pioneered DBFOM projects prior to 2000, so it is not surprising that three of the 20 firms are Australia-based. Only one U.S. firm (Fluor) made it into the top-20 global players, though a lengthier table would have included Star America and Kiewit, which are in the top-25 global transportation P3 developers.

Just as infrastructure funds adjust their portfolios of projects, so do major P3 developers. Some maintain a portfolio of completed projects. Others tend to retain only some projects, selling others once they are in operation and demonstrating good performance. Here are illustrative examples of these kinds of transactions in 2023.

- Sacyr in May decided to sell a 49% stake in its Autovia del Eresma concession in Spain, one of a number of shadow-toll roadways. The winning bidder was a consortium of GED Infrastructure and Caser, one of Spain's largest insurance

companies. Sacyr also sold a 45% stake in its N6 toll road in Ireland.²⁰ And in November, Sacyr hired Goldman Sachs as its financial advisor for selling a minority stake in its four highway concessions in Colombia.²¹

- Abertis agreed to buy Spanish shadow-toll motorway Autovia del Camino from UBS Asset Management, an infrastructure investment fund. The concession expires in 2030, but Abertis bought it to add to its expanding motorway portfolio in Spain.²²
- ACS subsidiary Iridium in September acquired the remaining portion of the SH-288 express toll lanes concession in Houston, Texas. It bought out the remaining 21.6% share of its joint venture partner in the concession, Blueridge Transportation Group. Earlier it had bought out stakes held by Abertis and by Shikun & Binui.²³
- Fininc and Sacyr won the bidding for a major brownfield concession in Italy—the Turin ring road and four surrounding motorways. During the 12-year concession, Fininc/Sacyr will invest €800 million in motorway improvements and expect to generate €2.9 billion in toll revenues. The team won out over rival motorway operator ASTM, which had been operating the Turin motorways.²⁴
- ASTM and ASPI at mid-year were considering selling their combined controlling stakes in Milan’s A58 outer ring road concession. The concession term for the 32 km. ring road extends to 2065.²⁵
- Vinci and GEK Terna submitted competing bids for a 25-year brownfield concession to upgrade and operate the 70 km. Attiki Odos tolled motorway which constitutes the Athens ring road. GEK Terna’s high bid of €3.27 billion topped Vinci’s bid of €3.016, and Vinci’s appeal was rejected by the public procurement authority. The motorway was built in the 1990s.²⁶ As of mid-2023, Vinci Highways was in talks to acquire the 90 km. Vindhychal Expressway concession in India.²⁷

Table 7 zeroes in on P3 transportation developers active in the United States, listed in order by the number of DBFOM projects each has been involved in. The more detailed table

²⁰ Antonio Fabrizio, “Infra Fund, Insurer to Buy Sacyr’s Spanish Road Stake,” *Inframation*, 22 May 2023.

²¹ Eva Llorens and Jonathan Carmody, “Sacyr Hires Goldman Sachs for Sale of Colombian Road Concessions,” *Infralogic*, 3 November 2023.

²² Stefano Berra, “UBS AM Sells Spanish Road Concession to Abertis,” *Infralogic*, 7 December 2023.

²³ Stock Exchange filing, “ACS Subsidiary Completes Houston Toll Road Stake Acquisition,” *Inframation*, 19 September 2023.

²⁴ Stefano Berra, “Fininc-Sacyr Tie-Up Wins Italian Motorway Concession,” *Infralogic*, 9 October 2023.

²⁵ Stefano Berra, “Infra-Fund-Backed Shareholders Mull Italian Motorway Sale,” *Inframation*, 2 August 2023.

²⁶ Safak Costu, “Vinci Loses Appeal Against Attiki Odos Concession Process,” *BNN Breaking*, 24 November 2023.

²⁷ Sonu Mohanty, “Vinci Highways Considers Acquisition in India,” *Inframation*, 17 July 2023.

from which Table 7 is derived lists each of the individual projects each company has been involved with, either alone or in a joint venture with other developers. Hence, as with Table 6, the numbers of projects or total investment should not be added together. The more detailed source table, from the *Public Works Financing* Major Projects Database, includes 11 additional firms that have invested in only one project each.

TABLE 7: LARGEST U.S. TRANSPORTATION P3 DEVELOPERS

Company	Headquarters	US Projects	Project Cost Total (\$M)
Meridiam	France	9	\$18,684
Ferrovial/Cintra	Spain	7	\$21,200
ACS	Spain	6	\$11,049
Fluor	U.S.	6	\$14,700
John Laing	U.K.	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	U.S.	3	\$4,353
Shikun & Binui	Israel	3	\$5,795
Walsh	U.S.	2	\$2,437
Kiewit	U.S.	2	\$1,088
Fengate	Canada	2	\$2,500

Source: “US Transportation P3 Developers,” US Survey of Public-Private Partnerships,” *Public Works Financing*, January 2024

Finally, Table 8 offers a historical overview of U.S. greenfield P3 projects since the first project was financed in 1993. The first two projects relied on taxable bank debt, since neither tax-exempt private activity bonds (PABs) nor low-interest-rate TIFIA loans were available yet. Since Congress enabled those two financing methods, the large majority of U.S. DBFOM projects have used one or both, as the table shows.

Table 8 separates these projects into two groups. In the upper portion of the table are revenue-risk projects, financed largely based on projected user-fee revenue flows. The lower half of the table lists projects financed based on availability payments (APs) from the sponsoring agency. (Some of the AP projects include tolls, charged by the public agency, the revenue from which covers some or all of the availability payments.) As can be seen, the fraction of the project financed by equity investment is significantly higher for revenue-risk P3s. This is because those investors are taking on significant revenue risk in addition to the other risks of greenfield projects (cost overruns, late completion, etc.). The additional equity also offers creditors such as bond-buyers a “cushion” in the event of a recession that reduces user-fee revenues. The P3 entity therefore has a better chance of keeping current

on debt-service payments to bondholders during such periods. In addition, the government's direct contribution to the cost of building the project is significantly lower in revenue-risk P3s compared with availability-payment P3s, which means less of a burden on taxpayers. The fraction provided by equity averaged 28% in revenue-risk P3s compared with 6% in availability-payment P3s. Accordingly, the extent of government support averaged 8.3% in revenue-risk projects compared with 34.9% in availability-payment projects.

The only new project that reached financial close in 2023 is the New York MTA project to upgrade subway stations to meet federal Americans with Disabilities Act (ADA) requirements. The government funding for this project (\$391 million) includes a substantial completion payment, periodic progress payments, and \$23.3 million in availability payments. The tax-exempt bonds totaling \$327 million are listed in the PABs column for comparative purposes. Equity at \$25 million is 3% of the financing total.

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

Project	Type	Govt. (M)	Infra Bank Loan	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, Texas	RR	\$17		\$357	\$100	0	\$375	\$849	44%	2016
I-66, Virginia	RR	\$0		\$1,229	\$737	0	\$1,549	\$3,515	44%	2017
I-95, ext., Virginia	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%	0.1%	16.6%	15.4%	31.6%	28.0%			

Project	Type	Govt. (M)	Infra Bank Loan	TIFIA (M)	PABs (M)	Bank Debt (M)	Equity (M)	Total (M)	% Equity	Financial Close
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	AP	\$1,599		\$875	\$313	\$0	\$139	\$2,926	5%	2016
LaGuardia Terminal	AP	\$1,200		\$0	\$2,400	\$0	\$200	\$3,800	5%	2016
I-70, Colorado	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
NY MYA ADA	AP	\$391		\$0	\$327	\$0	\$25	\$743	3%	2023
Total		\$9,349		\$4,448	\$9,242	\$2,116	\$1,601	\$26,756		
Average		\$550		\$262	\$544	\$124	\$94	\$1,574		
Percent		34.9%		16.6%	34.5%	7.9%	6.0%			

3.2

U.S. P3 DEVELOPMENTS IN 2023

The largest U.S. P3 transportation project to reach financial close in 2023 was a brownfield project, under which Abertis agreed to a 40-year concession to modernize, operate, and maintain the four Puerto Rico toll roads for which it was not already responsible: PR-20, PR-52, PR-53, and PR-66. Abertis' up-front concession fee of \$2.85 billion will enable the Puerto Rico Highway & Transportation Authority to repay its debts.²⁸

The largest greenfield highway P3 to gain approval (in January 2024) was the \$2.1 billion Calcasieu River bridge project on I-10 near Lake Charles, Louisiana. After having been rejected by a joint legislative committee in October, a revised 50-year DBFOM P3 agreement was approved by the same committee in January 2024. The project will replace a 71-year-old four-lane Interstate bridge with a state-of-the-art six-lane bridge with electronic toll collection. As this was being written, financial close on this revenue-risk P3 was expected by April 5, 2024.²⁹

²⁸ News release, "O'Melveny Advises the Puerto Rico P3 Authority in US\$2.85 Billion Privatization of Four Puerto Rican Toll Roads," O'Melveny, 22 December 2023.

²⁹ Victor Skinner, "Louisiana Lawmakers Approve \$2.1B Calcasieu River Bridge Deal," *The Center Square*, 30 January 2024.



The largest greenfield highway P3 to gain approval (in January 2024) was the \$2.1 billion Calcasieu River bridge project on I-10 near Lake Charles, Louisiana.



Brightline Florida, the privately funded higher-speed rail service, opened its new link between West Palm Beach and Orlando in September. Including its original links between Miami, Ft. Lauderdale, and West Palm Beach, the project cost \$6.6 billion. It was financed largely by \$2.2 billion in equity, and \$3.1 billion in tax-exempt private activity bonds.³⁰

Reaching financial close in May was the New York City MTA availability-payment P3 project, discussed previously in connection with Table 8. The concession holder is a joint venture of ASTM North America and Halmar International.³¹

Other U.S. P3 transportation developments in 2023 included the following:

- In March, Transurban—which had spent more than a year in predevelopment work on what was expected to be the nation’s largest express toll lanes P3 project—announced its withdrawal from the Maryland project. The election of a new governor who was not P3-friendly, coupled with environmental and NIMBY opposition to express toll lanes on the I-495 Capital Beltway and I-270, made getting to a workable DBFOM P3 agreement unlikely.³²
- April saw the opening of a privately financed truck toll bridge linking the CenterPoint Intermodal Center (CIC) in Joliet, Illinois to I-80, which otherwise had no connection to the nation’s largest inland port. United Bridge Partners built and is operating the bridge under a 99-year lease.³³
- In June, the Illinois Legislature enacted a new transportation P3 law that will allow Illinois DOT and the Illinois Tollway to accept unsolicited P3 proposals. It also

³⁰ Michael Bennon, “Brightline’s Miami to Orlando Extension Starts Operations,” *Public Works Financing*, September 2023.

³¹ Tanvi Acharya, “MTA’s First P3 Project Reaches FC,” *IJ Global*, 12 May 2023.

³² Michael Bennon, “Transurban Withdraws from OP Lanes Predevelopment,” *Public Works Financing*, March 2023.

³³ Robert Poole, “P3 Truck Toll Bridge Makes Debut in Illinois,” *Surface Transportation Innovations*, May 2023.

authorizes the state's first express toll lanes project, for congested I-55, and allows Illinois DOT to procure the project as a DBFOM P3.³⁴

- In November, voters in Cincinnati approved the city government's proposal to sell the city-owned freight railroad line to Norfolk Southern railroad for \$1.6 billion. NS had been operating the line under contract to the city. The proceeds will be used to create an infrastructure fund for the city.³⁵

Financial market changes in the second half of 2023 led to several refinancings of P3 transportation projects:

- In August, Cintra refinanced senior lien revenue bonds of its North Tarrant Express (NTE) project in Fort Worth, Texas. The proceeds will be used for \$355 million in capacity improvements in the express lanes on I-820 and SH 121/183, a 13-mile route between Fort Worth and the DFW Airport.³⁶
- In October, the SH 130 P3 concession company for this toll road between the metro areas of Austin and San Antonio, Texas refinanced nearly \$1 billion of its debt. The toll road experienced a large increase in truck traffic in 2023 due in part to new industrial development along the corridor, including facilities for Tesla and Samsung.³⁷
- Also in October, the Chicago Skyway concession reached financial close on a \$368 million refinancing by majority-owner Atlas Arteria. The tollway's debt was \$1.54 billion as of the financial close.³⁸
- The troubled LAX Automated People Mover project experienced a downgrade on its \$1.2 billion senior lien revenue bonds, whose outlook Fitch Ratings changed to "negative" in September. The 30-year availability-payment P3 at Los Angeles International Airport has experienced cost overruns and schedule delays.³⁹

³⁴ Robert Poole, "Illinois to Add Express Toll Lanes," *Surface Transportation Innovations*, June 2023.

³⁵ Robert Poole, "Cincinnati Voters Approve Railroad Sale," *Surface Transportation Innovations*, December 2023

³⁶ Michael Bennon, "NTE Mobility Partners Closes Financing for North Tarrant Express Capex," *Public Works Financing*, August 2023

³⁷ Matt O'Brien and Eugene Gilligan, "SH 130 Closes on Long-Planned Refi Deal," *Infralogic*, 20 October 2023.

³⁸ Jeremiah Pua, "Chicago Skyway Completes Latest Refinancing Round," *Infralogic*, 20 October 2023.

³⁹ Michael Bennon, "Fitch Updates LAX APM Senior Debt Rating—Outlook Negative," *Public Works Financing*, September 2023.

3.3

POTENTIAL FUTURE U.S. P3 TRANSPORTATION PROJECTS

The outlook for U.S. transportation P3s is positive for 2024. Major highway P3 projects are in the pipeline in Georgia, with likely projects within the next few years in Illinois, North Carolina, Tennessee, and Virginia. There are also interesting possibilities in other states.

Georgia DOT is in procurement for a DBFOM P3 project to add express toll lanes (ETLs) to SR 400 in the northern Atlanta suburbs, with two additional revenue-risk P3s planned for the northern half of the I-285 Perimeter. The SR 400 ETLs will be GDOT's first revenue-risk P3.⁴⁰ The ETL projects on the Perimeter are also planned as revenue-risk P3s. GDOT expects to announce the preferred bidder for SR 400 in third-quarter 2024.⁴¹

North Carolina DOT and the Charlotte Regional Transportation Planning Organization (CRTPO) are studying the feasibility of adding ETLs to I-77 between downtown Charlotte and the South Carolina border. Cintra proposed the project in an unsolicited proposal submitted in 2022.⁴² After internal study, the proposal was rejected, but in coordination with CRTPO, NCDOT is studying the trade-offs between a state-funded ETL project and a revenue-risk P3 project similar to Cintra's successful project on I-77 north of Charlotte.⁴³

The Illinois Legislature gave the state DOT a green light to use a P3 to implement ETLs on highly-congested I-55 in the Chicago metro area (which would be the first ETLs in Illinois).⁴⁴

Tennessee DOT is in the planning process for P3s to add ETLs to four congested urban expressways under its Choice Lanes program approved by the legislature early in 2023. The initial corridors are I-24 and I-65 in Nashville, I-24 West in Chattanooga, and I-40 East out of Knoxville.⁴⁵ The same legislation authorized revenue-risk DBFOM P3 procurement in Tennessee.

⁴⁰ Michael Bennon, "Teams Shortlisted for Atlanta SR400 Express Lanes Project," *Public Works Financing*, September 2022.

⁴¹ Eugene Gilligan, "Georgia Sets Preferred Bidder Timeline for Highway P3 Projects," *Infralogic*, 20 January 2024.

⁴² Michael Bennon, "Unsolicited Proposal for I-77 Express Lane Extension Rejected," *Public Works Financing*, August 2023.

⁴³ Joe Marusak, "I-77 Charlotte Commute Has Gotten Faster Despite Backups, More Cars, Toll Operator Says," *The Charlotte Observer*, 25 October 2023.

⁴⁴ Michael Bennon, "Illinois I-55 Managed Lanes Gets Surprise Legislative Approval," *Public Works Financing*, May 2023.

⁴⁵ Michael Bennon, "Tennessee Designates Choice Lane Corridors," *Public Works Financing*, January 2024.

Virginia DOT has studies under way for adding ETLs to the I-495 Beltway between I-95 and the Woodrow Wilson Bridge across the Potomac River.⁴⁶ VDOT and Transurban are also studying the possible reconfiguration of the I-95 ETLs from reversible to bi-directional.⁴⁷

Colorado's Northwest Parkway P3 concession was sold by its current shareholders (DIF, Northleaf, and HICL) to Vinci Highways for an undisclosed price. This is Vinci's first significant U.S. revenue-risk P3. The Northwest Parkway concession has 83 years remaining.⁴⁸

There are several other possible projects of a more speculative nature.

- In January 2023 Michigan DOT released a major study of the feasibility of rebuilding and modernizing the state's Interstate highways via toll financing. The HNTB/CDM Smith study proposed an initial project focused on eight corridors totaling 545 route-miles. The estimated cost of \$18.5 billion could be financed via realistic car and truck toll rates.⁴⁹ Thus far neither Michigan DOT nor state legislators have proposed going forward with the tolled reconstruction plan. If they decide to proceed, since Michigan has no state toll agency, procurement via long-term revenue-risk DBFOM P3s would be a possible choice.⁵⁰
- The Louisiana Department of Transportation and Development (DOTD) is considering a revenue-risk DBFOM P3 for a new Mississippi River Bridge at Baton Rouge, Louisiana. It is aimed at reducing serious congestion on capital area roadways. As of mid-2023, alternative locations have been reduced to three, which are going through environmental assessment. The estimated cost of the bridge itself is \$1.5 billion, not including connectors, and the stated policy is that it will be tolled.⁵¹

⁴⁶ Luz Lazo, "Virginia Weighs 11 More Miles of Tolled Beltway Lanes into Maryland," *Washington Post*, 5 October 2023.

⁴⁷ Lakshmi Iver, "Transurban-backed Company Explores Off-Peak Lane Capacity in US," *Infralogic*, 13 November 2023.

⁴⁸ Liam Ford and Antonio Fabrizio, "Vinci Acquires 100% of Northwest Parkway Concession in Colorado," *Infralogic*, 28 February 2024.

⁴⁹ HNTB and CDM Smith, "Michigan Statewide Tolling Study: Strategic Implementation Plan," Michigan DOT, 1 December 2022.

⁵⁰ Robert Poole, "Michigan Interstate Tolling Study Released," *Surface Transportation Innovations*, February 2023.

⁵¹ WBRZ, "Location for New Mississippi River Bridge Should Be Unveiled by Next August," *WBRZ*, 26 June, 2023.

- The public-private partnership for the \$12 billion Brightline West high-speed rail project moved closer to financial close in early 2024, with the announcement of \$2.5 billion in tax-exempt private activity bonds (PABs). In 2023 the project was awarded a \$3 billion federal passenger rail grant. The new 186 mph high-speed rail line will link Las Vegas, Nevada to an eastern suburb of greater Los Angeles—Rancho Cucamonga in San Bernardino County, where it will connect to a commuter rail line.⁵²
- The Port of New Orleans has commissioned consulting firm WSP to provide a P3 strategy for developing the planned St. Bernard elevated transportation corridor linking the port’s forthcoming Louisiana International Terminal with I-510.⁵³
- A long-shot potential project would be a revenue-risk DBFOM P3 for Texas DOT’s planned project to rebuild I-35 through downtown Austin. The current state-funded plan has an estimated cost of \$4.5 billion, relying solely on state and federal funds. If the “managed” HOV lanes planned for the project were replaced by variably priced ETLs, like those on I-635 in Dallas and the NTE in Fort Worth, the toll revenue from the project would likely finance a large share of the reconstruction cost, while significantly reducing congestion on that stretch of I-35. In October Austin City Councilmember Mackenzie Kelly proposed this P3 alternative, and City Manager Jesus Garcia said they are looking into it.⁵⁴ Doing this would require the Texas Legislature to exempt this project from current state policy, which does not allow more DBFOM highway P3s or new projects that involve tolls.
- Another potential P3 project would extend the express toll lanes on I-4 in central Florida in both directions—northeast toward Daytona Beach and southwest toward Tampa. The existing I-4 ETLs opened in 2022 and cover 20 miles through central Orlando and its suburbs. Congestion remains severe beyond the limits of the ETLs, which were developed as a hybrid (availability payments but also tolls) DBFOM P3. Florida policy limits the extent of availability payment liability on the state’s balance sheet, but current Florida law does not allow for revenue-risk P3s. Were that to change, such a P3 would make sense for this much-needed project to expand I-4’s capacity in a long-term sustainable way.

⁵² Liam Ford, “Brightline West Financing Coming Into Place as Test Work Starts,” *Infralogic*, 24 January 2024.

⁵³ Press release, “WSP to Evaluate Port NOLA Highway Terminal Connection P3,” *Infralogic*, 22 January 2024.

⁵⁴ Eugene Gilligan, “Council Member Calls for Texas City to Consider Highway P3,” *Infralogic*, 23 October 2023.

3.4

GLOBAL STUDY ON BENEFITS OF HIGHWAY P3 CONCESSIONS

A global assessment of the benefits and costs of 21 toll-financed highway P3 projects in nine developed countries found benefits exceeding costs for the 16 projects that have been completed and are in operation. Benefits thus far total \$29 billion while costs (including for those still under construction) total \$23.5 billion. This suggests that over the full life of these 21 concessions, benefits will likely far exceed costs.

The study was carried out by transportation economics firm Steer, based on project data provided by Cintra, the surface transportation arm of Spanish infrastructure company Ferrovial.⁵⁵ The report, dated October 2022, is “Economic Impact of Cintra Assets” and is available online.

This appears to be the first global study that uses a standard methodology to assess benefits in multiple countries, which permits fair comparisons of projects in the nine countries. The benefits are assessed in the following categories:

- Expenditure impacts, assessed via standard input/output models;
- User benefits: travel time savings, reliability increase, reduced vehicle operating costs;
- External benefits: increased safety, reduced emissions; and
- Wider economic benefits: urban agglomeration benefits (increased economic productivity).

Input/output models often reflect local impacts from a project being constructed in one part of a country rather than in another. But since they are widely used, and the Steer study followed mainstream U.S. and OECD procedures, these numbers are included here for completeness. The economic impact from the \$23.5 billion in project construction and operations to date totaled \$60.8 billion and 334,500 full-time-equivalent job-years.

Far more interesting are user benefits, external benefits, and agglomeration benefits. The projects analyzed include four U.S. managed lanes projects, three U.S. urban toll roads, three phases of a new Canadian urban toll road, eight new interurban toll roads in Europe and Australia, and one new toll network in the Azores. In each of these cases, *user benefits*

⁵⁵ Steer Group, “Economic Impacts of Cintra Assets,” October 2022 (<https://static.ferrovial.com/wp-content/uploads/2022/11/03094212/economic-impact-of-cintra-assets-oct-22-with-disclaimer.pdf>)

were assessed by comparing travel time, reliability of travel time, and reduced vehicle operating cost for those using the new toll facilities compared with existing routes they would have used had the new capacity not been built. Induced demand was estimated and assessed separately. All assessments included both light and heavy vehicles.



The economic impact from the \$23.5 billion in project construction and operations to date totaled \$60.8 billion and 334,500 full-time-equivalent job-years.



External benefits were estimated for both road safety and emissions changes. For the safety calculations, project and no-project accident rates were estimated, reflecting that more of the trips in the no-project alternatives would have been undertaken in more-congested conditions and with a larger fraction on non-limited-access roadways. Emissions estimates followed U.S. DOT 2021 emissions benefit/cost guidance and assessed CO₂, nitrogen oxides, and PM_{2.5}. Emission rates were based on MOVES 3 model for the U.S. cases and comparable government models for Australia, Canada, and Europe.

Wider economic benefits reflect research by economists on urban agglomeration impacts. In brief, shorter travel times between homes and jobs enable more positive-sum transactions to take place between employers and prospective employees, and many urban economic studies have quantified the impact of this on the economic productivity of large urban areas. The UK Department for Transport routinely does this kind of analysis; alas, U.S. DOT and state DOTs do not.

Table 4.3 in the report summarizes the socioeconomic impacts of the 16 projects that had been in operation for at least a year by the end of 2021. The results were as follows:

User benefits	\$23.25 billion
External benefits	\$ 1.89 billion
Agglomeration benefits	\$ 3.95 billion
Total:	\$29.09 billion

Would all those benefits have occurred if these projects had been funded conventionally by state legislators and implemented via traditional design-bid-build or design-build

contracts? Perhaps, but consider some key differences. These P3 projects employed long-term financing via toll revenue bonds and investor equity. This means they had to meet a market test of generating enough traffic over the 35- to 99-year term of the P3 agreement to pay off the bonds, provide a return to the equity investors, and cover operating and maintenance costs for the entire duration of the agreement. With conventional procurement, there would be no market test to guard against boondoggles and no guarantee against deferred maintenance, which is quite common across the United States. Moreover, in today's world, when federal and state fuel tax receipts don't come close to covering the capital and operating costs of large-scale highway projects, an increasing share of the federal support is borrowed, adding trillions to the national debt (e.g., the entire cost of the 2021 IIJA legislation). That is not a sustainable way to fund highways.



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This analysis from Steer is a strong validation of the toll-financed long-term P3 model. It is working well in Australia, Europe, and (thus far) to a limited extent in the United States. It could do far more if legislators and state DOTs fully understood it.

PART 4

PUBLIC PENSION FUND INFRASTRUCTURE INVESTMENT

4.1

INTRODUCTION

Pension funds, like insurance companies, have very large amounts of long-term liabilities—the promised benefits to future retirees. Accordingly, also like insurance companies, they need long-term investments that are likely to grow over time. Traditionally, most pension funds invested in relatively safe long-term bonds, as well as relatively safe corporate stocks in industries such as railroads and investor-owned utilities. Pension funds do not invest in government utilities and other infrastructure (such as airports or seaports) because those facilities' bonds are tax-exempt, and that exemption offers no benefit to nonprofit, tax-exempt pension funds. And they cannot invest in shares of government utilities since there are no such shares.

Over the last three decades, as noted in Part 1, governments in many countries have privatized government-owned utilities (electricity, water, telecommunications, airports, seaports, toll roads). When the privatization transfers actual ownership, shares in such companies trade on stock markets, and can be purchased and held by pension funds as alternative long-term investments. When privatization takes the form of a long-term public-private partnership, the P3 entity is typically financed via a mix of revenue bonds and

private equity. Infrastructure investment funds, as described in Part 2, assemble portfolios of infrastructure equity, in which pension funds can invest.



When the privatization transfers actual ownership, shares in such companies trade on stock markets, and can be purchased and held by pension funds as alternative long-term investments.



When a pension fund decides to allocate a portion of its assets to infrastructure, it generally deals with one or more funds such as those listed in Table 1 in this report. The pension fund itself in most cases does not have the specialized knowledge to select specific P3 projects in which to invest. It allocates a sum to an infrastructure fund for two reasons: to take advantage of the fund's expertise in investor-owned and P3 infrastructure and to gain the advantage of a balanced portfolio of projects and companies (analogous to an individual investor buying mutual funds rather than individual stocks).

Australian and Canadian public pension funds pioneered infrastructure investing in the 1990s. Australia's federal government in 1992 required employers to set aside 3% of nearly all employee wages in their choice of approved pension funds. Over several decades, the requirement was gradually increased to 9.5%. Due in part to Australia's large-scale privatizations of utilities and infrastructure in subsequent years, its pension funds had growing domestic infrastructure investment opportunities. As the pension funds grew in size, they diversified their infrastructure investments to other countries that employed privatization and long-term P3s. In the process, several Australian infrastructure investors became key global companies in that field, such as Macquarie (#1 in Table 1) and IFM Investors (#10).

The advent and growth of public pension fund investment in Canada was documented in a paper prepared for the Harvard Law School in 2022.⁵⁶ A 1986 task force created by Canadian Treasurer Robert Nixon began with a study of how Ontario's public pensions' investment returns could be improved. In 1990, the first new pension system was created—

⁵⁶ 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.

Ontario Teachers Pension Plan (OTPP), with a charter that insulated it from politics. Its strategy of investing in private markets in equities, real estate, and infrastructure became the model for a set of similar national and provincial pension systems.

4.2

INTERNATIONAL PENSION FUND INFRASTRUCTURE DEVELOPMENTS, 2023

Overall, 2023 was a good year for Australian and Canadian pension systems. After a rather poor year in 2022, Australian pension funds had a median increase in gross asset value of 10.8%. This performance “wiped out the previous year’s 5.1% loss [but was also] the 11th positive return in the past 12 years and the 26th positive return in the 31-year history” of the current pension law.⁵⁷ Canadian pension funds also had a good year, generating a median return of 8.4% in the fourth quarter, and an annual median return of 10.0%, according to the Northern Trust Canada Universe.⁵⁸

Here are some examples of 2023 transactions by leading Australian and Canadian pension funds in 2023.

IFM Investors: As of July, nine new investors had committed to the open-ended IFM Global Infrastructure Fund, including six local U.K. pension funds and three Swiss pension funds.⁵⁹ In October, the pension funds of Swiss biotech company Lonza Group and Geneva-based Pictet Asset Management invested in that fund, while the U.K. pension fund of Avon withdrew from IFM’s Global Core Infrastructure Fund.⁶⁰ In January, the Swiss collective pension foundation COPRE and the pension fund of Switzerland’s Basel Cantonal Bank bought the stakes in IFM Global Infrastructure Fund previously owned by two U.K. pension funds.⁶¹

CDPQ (Caisse de dépôt et placement du Québec): In February, CDPQ reached an agreement with Transurban to buy 50% of the latter’s A25 toll road concession in Montreal, for \$264 million. Transurban CEO Scott Charleton told *Inframation* that “CDPQ is a behemoth in their home market, so partly [this] is a strategic alignment.” In 2021 Transurban sold 50% of its

⁵⁷ Barbara Drury, “Pension Fund Performance to December 2023,” *SuperGuide*, 5 February 2024.

⁵⁸ Asset Servicing News, “Northern Trust Pension Universe Data: Canadian Pension Plans Post Strong 2023 Returns as Markets Surge in Q4,” Northwest Trust, 2 February 2024.

⁵⁹ Pablo Martinez, “IFM’s Global Infra Fund Adds Nine LPs,” *Inframation*, 19 July 2023.

⁶⁰ Andras Csillik, “Swiss Investors Back IFM Infra Fund,” *Infralogic*, 30 October 2023.

⁶¹ Attila Veszelyovszky, “Pension Investors Sell IFM Infra Fund Stakes,” *Inframation*, 1 February 2023.

Virginia P3 highway projects to three Australian pension funds: AustralianSuper, CPP Investments, and UniSuper.⁶²

CPPIB (Canada Pension Plan Investment Board) and OMERS (Ontario Municipal Employees Retirement System): These two Canadian pension funds in June enabled their Infravit Trust to acquire four Indian toll road concessions from Brookfield Asset Management for \$1 billion; Allianz Capital invested alongside CPPIB and OMERS.⁶³

OTPP (Ontario Teachers Pension Plan): This Canadian pension fund has made several investments in European airports. In January, it prepared to refinance €160 million in debt of its Bristol Airport (U.K.) stake, which it acquired in 2014 from Macquarie. It later sold 30% to a group of Australian pension funds. OTPP also has investments in U.K.'s Belfast, Birmingham, and London City Airports.⁶⁴

4.3

U.S. PUBLIC PENSION FUND DEVELOPMENTS

U.S. public pension systems still have a long way to go to match their Australian and Canadian counterparts. According to a report from Reason Foundation's Pension Integrity Project, the estimated funding ratio of the 118 U.S. state public employee pension funds in 2023 was 76% funded.⁶⁵ Only two states were fully funded: Washington at 107% and New York at 102%. The least-funded were Kentucky (47% funded) and New Jersey (48%).

To increase their overall investment return, J.P. Morgan Asset Management has suggested that a typical U.S. pension fund "should start off by allocating five to 10% of its assets to [property and infrastructure], with the share rising to 15%–20% over time."⁶⁶ It's unlikely that any U.S. public pension fund comes close to that.

The pioneer infrastructure investor among U.S. public pension systems was California's huge CalPERS. Among its individual infrastructure assets were stakes in London Gatwick Airport and the concession company of the Indiana Toll Road. In 2021 CalPERS committed

⁶² Shaun Drummond, "Transurban Agrees to Sell 50% of Montreal Road to CDPQ," *Inframation*, 6 February 2023.

⁶³ Rouhan Sharma, "CPPIB's India Trust Concludes Acquisition of Brookfield's India Roads," *Inframation*, 16 June 2023.

⁶⁴ Rory Gallivan, "OTTP's Bristol Airport Prepping Refi," *Inframation*, 27 January 2023.

⁶⁵ Pension Integrity Project, "Forecast: State Pension Debt Totals \$1.3 Trillion at the End of 2023," Reason Foundation, 26 September 2023.

⁶⁶ Buttonwood, "Do Physical Assets Offer Investors Refuge from Inflation?" *The Economist*, 11 September 2021.

\$1 billion to the Golden Reef Infrastructure Trust, a separately managed account within the Queensland Investment Corporation, a pension fund of the government of Australian state of Queensland. As of mid-2023, the CalPERS Real Assets program held assets worth \$71.2 billion, of which \$14.4 billion (31.7% of Real Assets) was infrastructure. Given the decline in real estate values in 2022-23, the Real Assets portfolio had a net return of -3.1% during FY 2023.⁶⁷ The overall CalPERS portfolio of \$463 billion had a return of 5.8% during this period. Even if infrastructure did much better than real estate during July 2022-June 2023, at only 3.1% of the total CalPERS portfolio, it could have only a very minor impact on the overall return. This pension system would be wise to invest less in real estate and more in revenue-generating infrastructure.

A growing number of state and local government pension funds made initial or increased commitments of funds to infrastructure investing in 2023, nearly always via one or more infrastructure investment funds. Here are snapshots, aimed at illustrating the range of pension plans investing in infrastructure and the breadth of infrastructure investment funds getting their business.



A growing number of state and local government pension funds made initial or increased commitments of funds to infrastructure investing in 2023, nearly always via one or more infrastructure investment funds.



In **February** the New York State Common Retirement Fund made two commitments: \$275 million to DigitalBridgePartners III and a \$200 million commitment to the Carlyle Renewable and Sustainable Energy Fund II. And the Virginia Retirement System committed \$100 million to DigitalBridgePartners III. It also allocated \$200 million to the PGIM Lending Separate Account. And the Kentucky Public Pensions Authority approved a \$175 million investment in Saba Capital Management.⁶⁸

⁶⁷ News release, “CalPERS Reports Preliminary 5.8% Investment Return for 2022-23 Fiscal Year, CalPERS, July 19, 2023.

⁶⁸ Andras Csillik, “Weekly Fund Commitments: Digital Bridge, Carlyle, PGIM, and Saba Collect USD 950m,” *InfraLogic*, 9 February 2023.

In **March** J.P. Morgan Infrastructure Investments Fund (IIF, an open-ended global fund) announced a new commitment from the pension fund of German pharmaceutical company Merck Serono, but the amount was not disclosed. In January, IIF received new commitments from Swiss pension fund Fondation de Prevoyance Richemont.⁶⁹

In **May** the Employees' Retirement System of Rhode Island (ERSRI) approved a \$25 million commitment to Stonepeak Opportunities Fund, and the state's OPEB System Trust committed \$2 million to the same fund. ERSRI had committed \$50 million to another Stonepeak infrastructure fund in recent years. Also in May, the Santa Barbara County (CA) Employees' Retirement System (SBCERS) committed \$10 million each to Stonepeak Global Opportunities Fund and Global Infrastructure Partners V. Including prior years' commitments to infrastructure, SBCERS' now has 9.33% of its assets invested in infrastructure.⁷⁰ Also, the Texas Municipal Retirement System (TMRS) approved \$150 million commitments each to Excelsior Renewable Energy Fund and Pearl Energy Investments III. TMRS has 3.1% of its assets invested in infrastructure as of 2023.⁷¹

In **June** four more public pension funds made new infrastructure commitments. The Illinois Municipal Retirement Fund (IMRF) committed \$35 million to EnCap Energy Capital Fund XII. The New York State Common Retirement Fund (NYSCRF) committed \$200 million to Northleaf Capital Partners IV and \$300 million to Brookfield Infrastructure Fund V. The Washington State Investment Board (WSIB) committed \$115 million in CBRE Minke Investments. And the Orange County (CA) Employees' Retirement System committed \$50 million to EnCap Flatrock Midstream Fund V.⁷²

In **July** the New Mexico State Investment Council committed \$150 million to LS Power Equity Partners V. The New York State Common Retirement Fund approved a \$450 million investment in EQT Infrastructure VI and \$70 million into Antin Infrastructure Partners V. The Tennessee Consolidated Retirement System committed \$60 million to Quantum Energy Partners VIII and \$10 million to its Co-Investment Fund.⁷³ Also in July, the Alameda County (CA) Employees' Retirement Association (ACERA) approved a \$30 million investment in LS Power Equity Partners V. Further, the Employees Retirement System of Texas committed

⁶⁹ Andras Csillik, "German Pension Scheme Backs JPMAM Infra Fund," *Inframation*, 24 March 2023.

⁷⁰ Andras Csillik, "Weekly Commitments: Stonepeak, Excelsior, Pearl, DigitalBridge, GIP," *Inframation*, 26 May 2023.

⁷¹ Ibid.

⁷² Andras Csillik, "Weekly Commitments: Encap, Northleaf, Brookfield, CBRE, OMNES," *Inframation*, 2 June 2023.

⁷³ Andras Csillik, "Weekly Commitments: LS Power, EQT, Antin, Quantum," *Inframation*, 7 July 2023.

\$77 million to Quantum Energy Partners VIII and \$75 million to Ardian Infrastructure Fund VI.⁷⁴

In **August** the Virginia Retirement System (VRS) disclosed a commitment of \$200 million each to NGP Natural Resources XIII and Global Infrastructure Partners V, plus a \$125 million commitment to LS Power Equity Partners V. And the Santa Barbara County Employees Retirement System approved an \$8.6 million commitment to Quantum Energy Partners VIII and \$1.4 million to its co-investment vehicle.⁷⁵

September was a big month for U.S. pension system investments in infrastructure funds. The Washington State Investment Board (WSIB) approved commitments of \$300 million to Schroders Greencoat Woodmont Renewables and \$200 million to the Ara Fund III. The Orange County Employees Retirement System (OCERS) approved a \$75 million commitment to EnCap Energy Capital Fund XII.⁷⁶ Also the new Illinois FIRST Fund, created to invest in infrastructure development funds, committed \$75 million to the Ullico Infrastructure Fund, which is the infrastructure investment vehicle for Ullico, a union-oriented developer.⁷⁷

The Baltimore City Fire & Police Employees Retirement System approved a \$25 million commitment to Grain Communications Opportunity Fund IV. The Kentucky Teachers' Retirement System approved up to \$60.5 million to be invested in Macquarie Infrastructure Partners VI. The Maryland State Retirement & Pension System disclosed a \$200 million commitment to Global Infrastructure Partners V and a \$150 million investment in Stonepeak Opportunities Fund. Also the Washington State Investment Board approved \$300 million in Schroders Greencoat Woodmont Renewables and \$200 million in the Ara Fund III.⁷⁸

Also in September, two more state pension funds and another local one made new commitments. The Arkansas Teacher Retirement System placed \$50 million with EnCap Energy Transition Fund II, and the School Employees Retirement System of Ohio committed \$20 million to Brookfield Super-Core Infrastructure Partners Co-Investment Fund. The Ventura County (CA) Employees' Retirement Association planned a \$20 million commitment

⁷⁴ Andras Csillik, "Weekly Commitments: LS Power, Quantum, Ardian," *Inframation*, 28 July 2023.

⁷⁵ Andras Csillik, "Weekly Commitments: NGP, LS Power, GIP, Quantum," *Inframation*, 25 August 2023..

⁷⁶ Andras Csillik, "Weekly Commitments: Encap, Schroders, ARA," *Inframation*, 8 September 2023.

⁷⁷ Liam Ford, "New Illinois State Fund Invests in Ullico Infra Fund," *Inframation*, 8 September 2023.

⁷⁸ Andras Csillik, "Weekly Commitments: Grain, Macquarie, GIP, Stonepeak, and Others," *Inframation*, 22 September 2023.

to HarbourVest Infrastructure Opportunities Fund III and \$25 million to Pantheon Global Infrastructure Fund IV.⁷⁹

October also saw new commitments by state and local pension systems. The New Mexico State Investment Council committed \$187.5 million to Copenhagen Infrastructure V. The Ohio Police & Fire Pension Fund invested \$80 million in EnCap Energy Transition Fund II. The Teacher Retirement System of Texas approved a \$125 million commitment to Energy Capital Partners V. Finally, the District of Columbia Retirement Board approved a \$100 million commitment to Grain Communications Opportunity Fund IV.⁸⁰

November continued to see more pension fund commitments. The Alaska Permanent Fund Corporation committed \$65 million to EnCap Energy Capital Fund XII and \$45 million to a co-investment vehicle. The Teachers' Retirement System of the State of Illinois committed \$100 million to NGP Natural Resources XIII. In addition, the Employees' Retirement System of Rhode Island committed \$15 million to IPI Partners III and the Rhode Island Pension and Other Post-Employment Benefits System Trust invested \$0.45 million into the same fund.⁸¹

The California Public Employees' Retirement Fund (CalPERS) approved a new commitment of \$200 million to IFM Global Infrastructure Co-Invest 1 and \$250 million to BIF V Co-Invest. The Connecticut Retirement Plans and Trust Funds announced it was considering a \$200 million commitment to Stonepeak Infrastructure Fund V. The New York State Common Retirement Fund disclosed a \$108 million investment in a fund managed by Antin Infrastructure Partners. The Washington State Investment Board approved up to a \$150 million investment in Lime Rock Resources VI. Also the Sacramento County Employees' Retirement System disclosed a \$50 million commitment to KKR Asia Pacific Infrastructure Investors II.⁸²

Late November saw several more commitments. The Illinois Municipal Retirement Fund approved commitments of \$75 million to Partners Group Direct Infrastructure IV and \$25 million to JLC Infrastructure Fund II. The Orange County Employees Retirement System

⁷⁹ Andras Csillik, "Weekly Commitments: HarbourVest, EnCap, Pantheon, Others," *Infralogic*, 29 September 2023.

⁸⁰ Andras Csillik, "Weekly Fund Commitments: Grain, Copenhagen, and Others Secure USD 650m," *Infralogic*, 9 October 2023.

⁸¹ Andras Csillik, "Weekly Fund Commitments: EnCap, NGP, and IPI Secure Around USD 225m," *Infralogic*, 6 November 2023.

⁸² Andras Csillik, "Weekly Fund Commitments: Lime Rock, KKR, Stonepeak and Others Secure Almost USD 1bn," *Infralogic*, 17 November 2023.

disclosed a \$50 million investment in Stonepeak Opportunities Fund and \$75 million in LS Power Equity Partners V. Finally, the New Mexico Educational Retirement Board committed \$150 million to Caledon Andromeda Investment IV.⁸³

With the end of the year approaching, **December** saw several more rounds of commitments. The Delaware Office of Pensions disclosed a commitment of up to \$20 million to Peppertree Capital Fund X and another \$30 million to SDC Digital Infrastructure Opportunity Fund IV. The Employees Retirement System of Texas approved a \$50 million commitment to Actis Long Life Infrastructure Fund II. In addition, the Teacher Retirement System of Texas committed \$175 million to ET Infrastructure Fund VI.⁸⁴

The State Universities Retirement System of Illinois announced a \$50 million commitment to Ember Infrastructure II. The Contra Costa County (CA) Employees' Retirement Association committed \$125 million to EQT Infrastructure Fund VI. Also, the Stanislaus County Employees' Retirement Association committed \$20 million to Carlyle Renewable and Sustainable Energy Fund II.⁸⁵

And at the end of the year, three more retirement systems made commitments. The New York State Common Retirement Fund made two commitments: \$375 million to Fundamental Advisors' Fundamental Empire Fund and \$250 million to Stonepeak Opportunities Fund. The Fire & Police Pension Association of Colorado made a \$50 million commitment to Brookfield Infrastructure Fund V. Finally, the San Antonio Fire and Police Pension Fund committed an additional \$20 million to Palistar Digital Infrastructure Fund III.⁸⁶

⁸³ Andras Csillik, "Weekly Fund Commitments: Partners Group, LC, Stonepeak, and Others," *Infralogic*, 27 November 2023.

⁸⁴ Andras Csillik, "Weekly Fund Commitments: EQT, Actis, Peppertree, and SDC Capital Collect USD 275m," *Infralogic*, 8 December 2023.

⁸⁵ Attila Veszlovsky, "Weekly Fund Commitments: EQT, Ember Infrastructure, and Carlyle Collect USD 195m," *Infralogic*, 15 December 2023.

⁸⁶ Attila Veszlovsky, "Weekly Commitments: Palistar Capital, Stonepeak, Fundamental Advisors, and Brookfield Collect USD 695m," *Infralogic*, 22 December 2023.

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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 the 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.

