

PENNSYLVANIA SERS



REAL ESTATE ANNUAL BOARD UPDATE

PERIOD ENDED DECEMBER 31, 2020

Presented June 8, 2021



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

TABLE OF CONTENTS

Page

Presentation:

- | | |
|---|----|
| 1. Real Estate Semi-Annual Performance Report | 3 |
| 2. Real Estate Portfolio Construction Update | 10 |
| 3. Real Estate Market Update | 15 |

Appendix

- | | |
|---------------------------------|----|
| 1. Investment Level Performance | 22 |
| 2. Disclaimers & Disclosures | 27 |



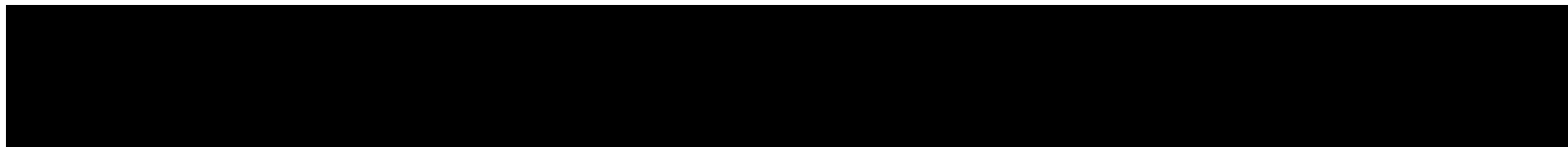
**1. REAL ESTATE SEMI-ANNUAL
PERFORMANCE REPORT**
AS OF DECEMBER 31, 2020

NEPC, LLC

PORTFOLIO PERFORMANCE SUMMARY

The table below displays trailing time period performance for the Pennsylvania State Employees Retirement System (“PA SERS”) Real Estate Portfolio as of December 31, 2020, along with select benchmarks

- The real estate portfolio rebounded in the second half of 2020 and generated a total net return of 4.2% for the year, after posting negative returns in the first half of the year
 - The portfolio outperformed both the core real estate benchmark (the NFI-ODCE Index) and the non-core benchmark (the CJA Real Estate Index) for the year



- The Plan’s Real Estate Performance is benchmarked against the NCREIF-ODCE Index (pool of open-end core funds) and the CJA Real Estate Index (pool of closed-end value-add/opportunity funds), two of the most widely used indices for real estate benchmarking

Portfolio Performance	YTD	1 Year	3 Year	5 Year	10 Year	Inception
Total Pennsylvania State Employees Retirement System	4.2%	4.2%	3.0%	3.1%	7.6%	7.1%
[REDACTED]						
NFI-ODCE Index ¹	0.3%	0.3%	4.0%	5.3%	8.9%	N/A
CJA Non-Core Real Estate Index ²	1.7%	1.7%	5.8%	7.8%	10.0%	N/A
S&P 500 Index	18.4%	18.4%	14.2%	15.2%	13.9%	N/A

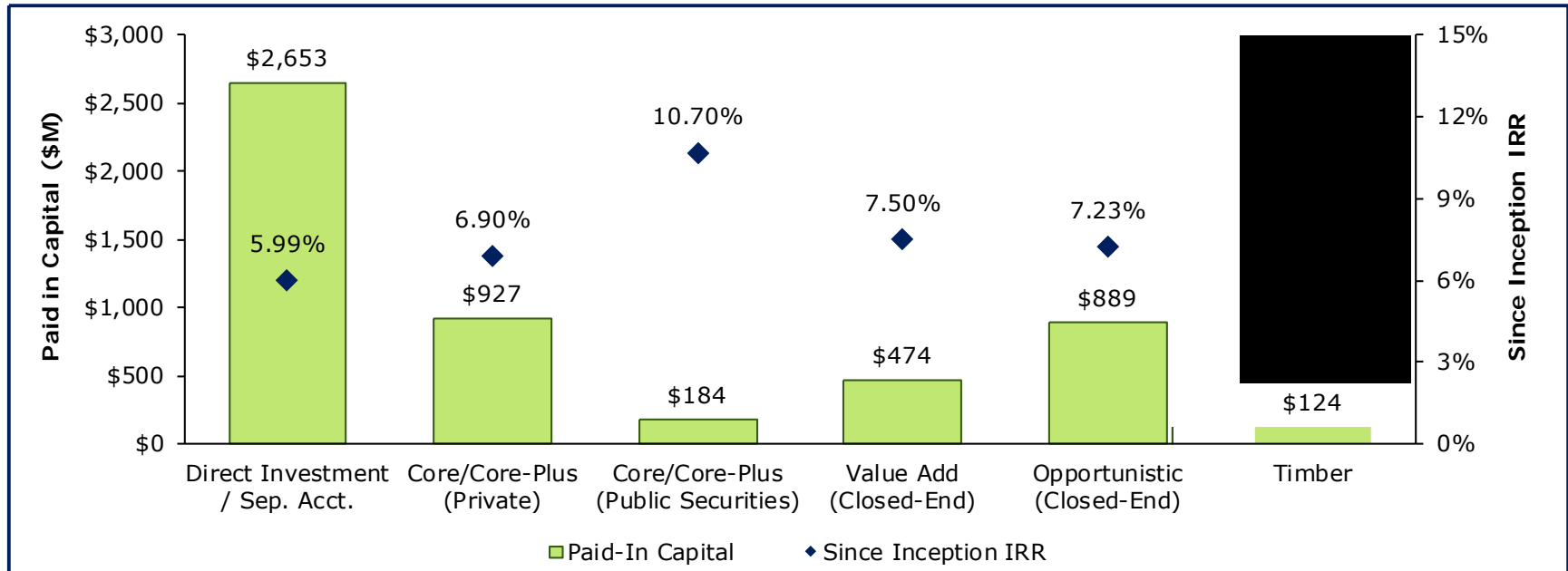
Data as of December 31, 2020. Sources include NCREIF, Thomson-One/Cambridge Associates, Manager data, and NEPC. Additional notes:

- NFI-ODCE Index represents pooled returns of open-end comingled core funds in the ODCE Index; returns shown are time-weighted, net of fees.
- CJA Benchmark represents pooled horizon internal rate of return (IRR) calculations, net of fees, across 1,186 real estate funds (including value-add/opportunistic).
- The timing and magnitude of fund cash flows are integral to the IRR performance. Benchmark indices that are time weighted measures should not be directly compared to dollar-weighted IRR calculations. Index data is continuously updated and is therefore subject to change.
- Returns shown do not take into account risk/volatility of underlying strategies.



PERFORMANCE BY INVESTMENT STRATEGY

In aggregate, current (active) investments in the portfolio, which are not fully liquidated, can be summarized in the following:



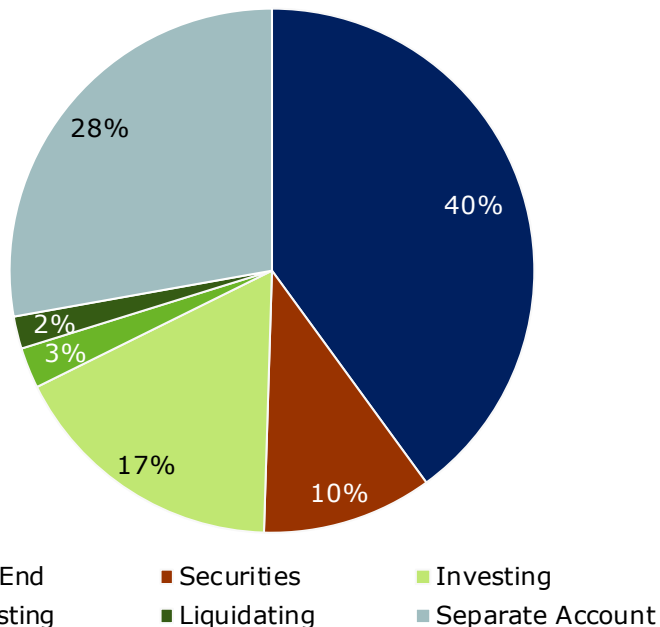
Investment Strategy	Commitment Amount	Paid-In Capital	Capital to be Funded	Cumulative Distributions	Current Valuation	Total Value	Net Gain / (Loss)	Call Ratio	DPI Ratio	TVPI Ratio	IRR (SI)
Direct Investment / Sep. Acct.	2,652,958,927	2,652,958,927	0	3,362,976,358	714,133,554	4,077,109,912	1,405,792,786	100%	1.26	1.53	5.99%
Core/Core-Plus (Private)	1,060,219,635	926,875,195	133,344,440	217,518,548	1,034,444,991	1,251,963,539	324,029,307	87%	0.23	1.35	6.90%
Core/Core-Plus (Public Securities)	183,616,773	183,616,773	0	36,168,336	271,659,616	307,827,952	124,211,179	100%	0.20	1.68	10.70%
Value Add (Closed-End)	574,414,747	473,658,408	100,756,339	396,250,029	234,330,642	630,580,671	140,583,090	82%	0.81	1.29	7.50%
Opportunistic (Closed-End)	1,282,828,249	889,327,018	343,501,232	932,020,676	327,216,230	1,259,236,906	352,152,741	69%	1.03	1.39	7.23%
Timber	124,231,969	124,231,969	0	242,667,376				100%	1.95		
Total (Active Funds)	5,878,270,300	5,250,668,290	577,602,011	5,187,601,324				89%	0.98		



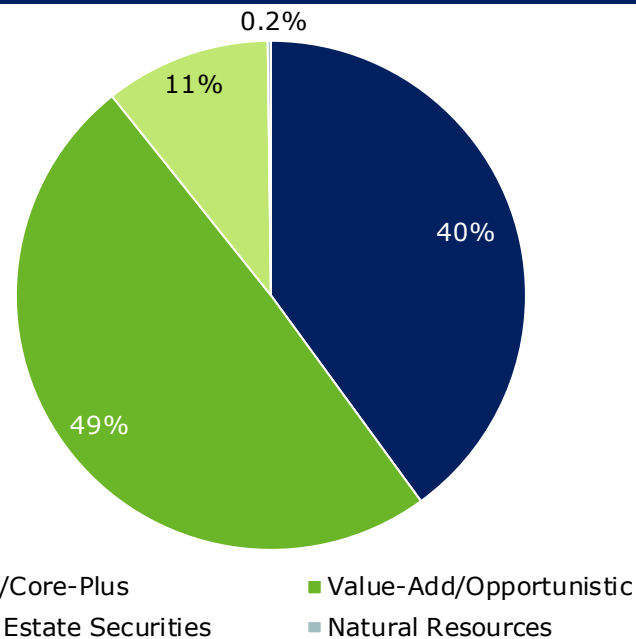
Data as of December 31, 2020. Liquidated investments not shown. Returns shown do not take into account risk/volatility of underlying strategies.

PORTFOLIO COMPOSITION

Allocation by Structure & Lifecycle



Allocation by Strategy



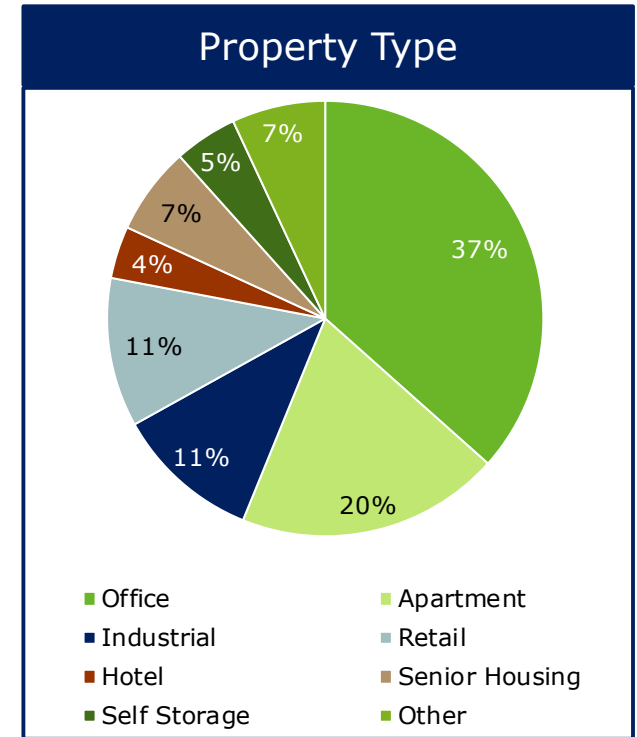
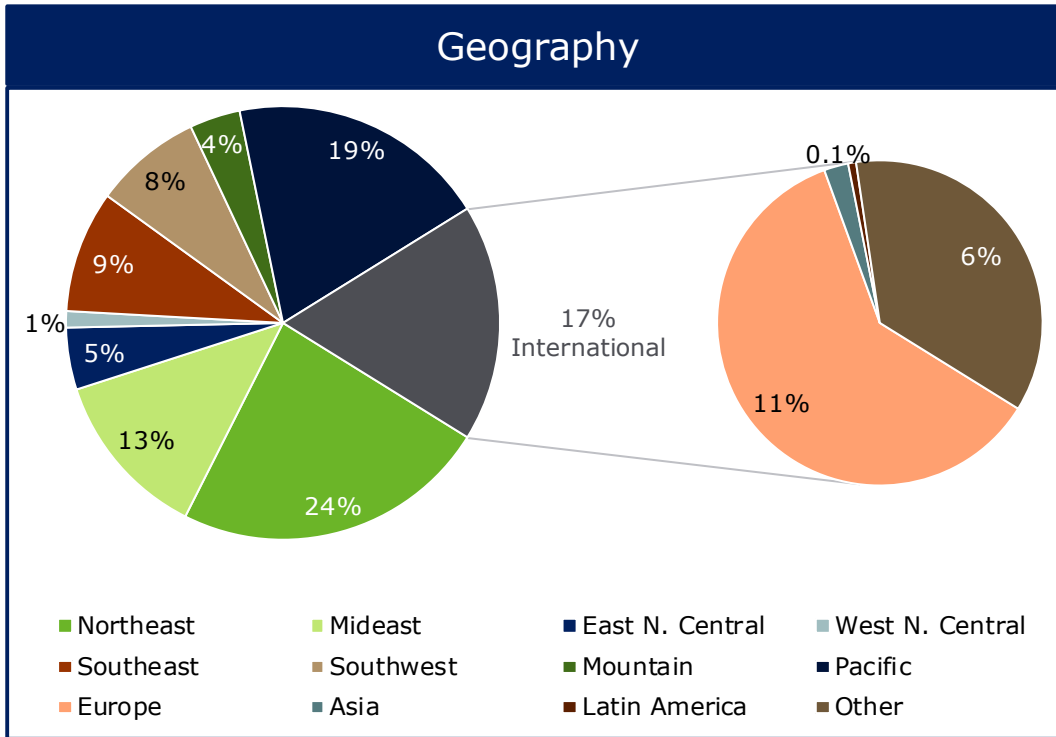
Investment Structure / Lifecycle Stage	Commitment Amount	Paid-In Capital	Capital to be Funded	Cumulative Distributions	Current Valuation	Total Value	Net Gain / (Loss)	Call Ratio	DPI Ratio	TVPI Ratio	IRR (SI)
Open-End	1,060,219,635	926,875,195	133,344,440	217,518,548	1,034,444,991	1,251,963,539	324,029,307	87%	0.23	1.35	6.90%
Securities	183,616,773	183,616,773	0	36,168,336	271,659,616	307,827,952	124,211,179	100%	0.20	1.68	10.70%
Investing	876,496,127	420,208,088	406,288,040	46,742,437	444,768,980	491,511,418	65,381,688	48%	0.11	1.15	8.82%
Harvesting	139,663,402	128,374,170	11,289,233	145,046,006	65,166,881	210,212,887	79,761,861	92%	1.11	1.61	12.35%
Liquidating	841,083,467	814,403,169	26,680,298	1,136,482,263				97%	1.35		
Separate Account	2,777,190,896	2,777,190,896	0	3,605,643,734	719,354,722	4,324,998,456	1,529,449,361	100%	1.29	1.55	5.99%
Total (Active Funds)	5,878,270,300	5,250,668,291	577,602,011	5,187,601,324				89%	0.98		



Data as of December 31, 2020. Returns shown do not take into account risk/volatility of underlying strategies

PORTFOLIO DIVERSIFICATION

- The Pennsylvania SERS real estate portfolio is broadly diversified by property type and geography within the U.S.
- The portfolio's international diversification has expanded in recent years
 - 17% of the portfolio is now invested outside the US, primarily in Europe

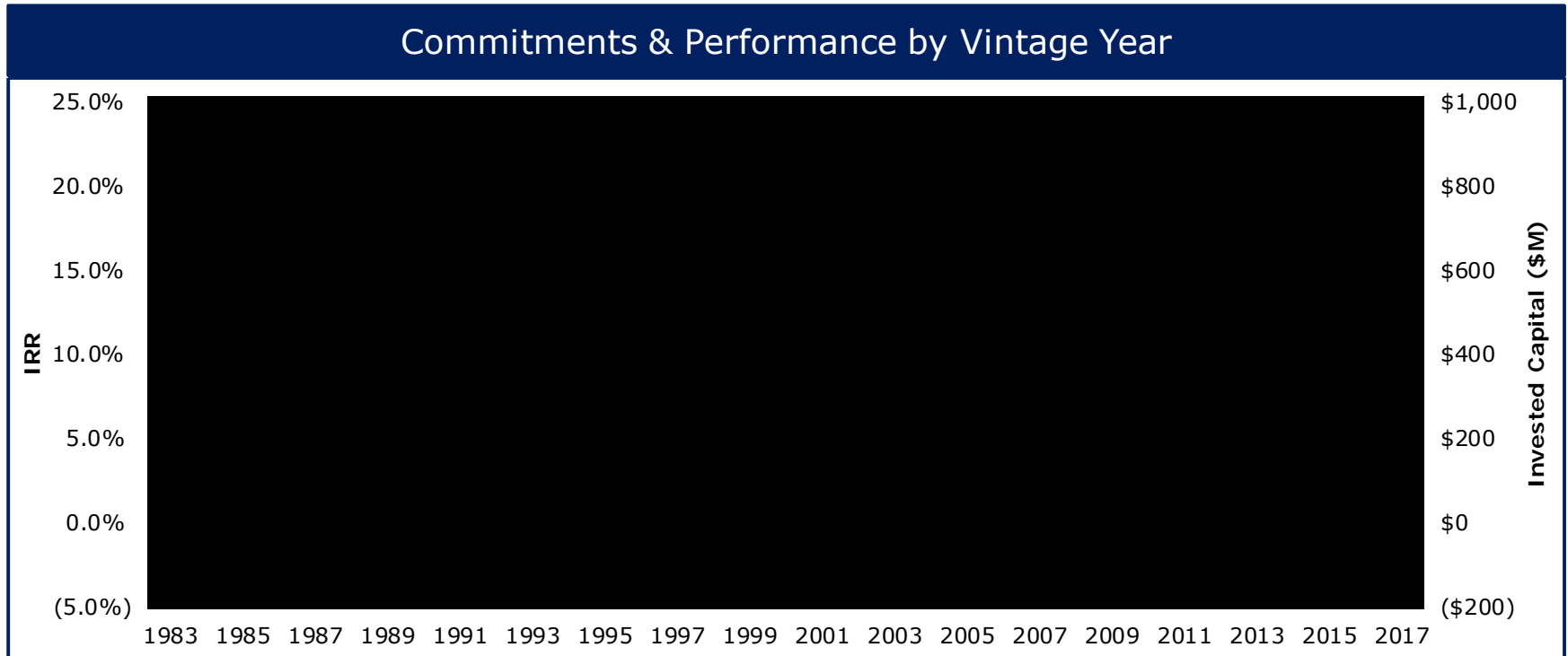


Data as of December 31, 2020. Underlying diversification information provided by Managers.

HISTORICAL PERFORMANCE BY VINTAGE

The following chart illustrates capital invested and inception-to-date performance by vintage year as of December 31, 2020

- Inconsistent pacing has negatively impacted portfolio performance
- Staff and NEPC are focused on maintaining a consistent investment pacing schedule to mitigate the risk of heavy capital investments in poor vintage years



Data as of December 31, 2020. Notes:

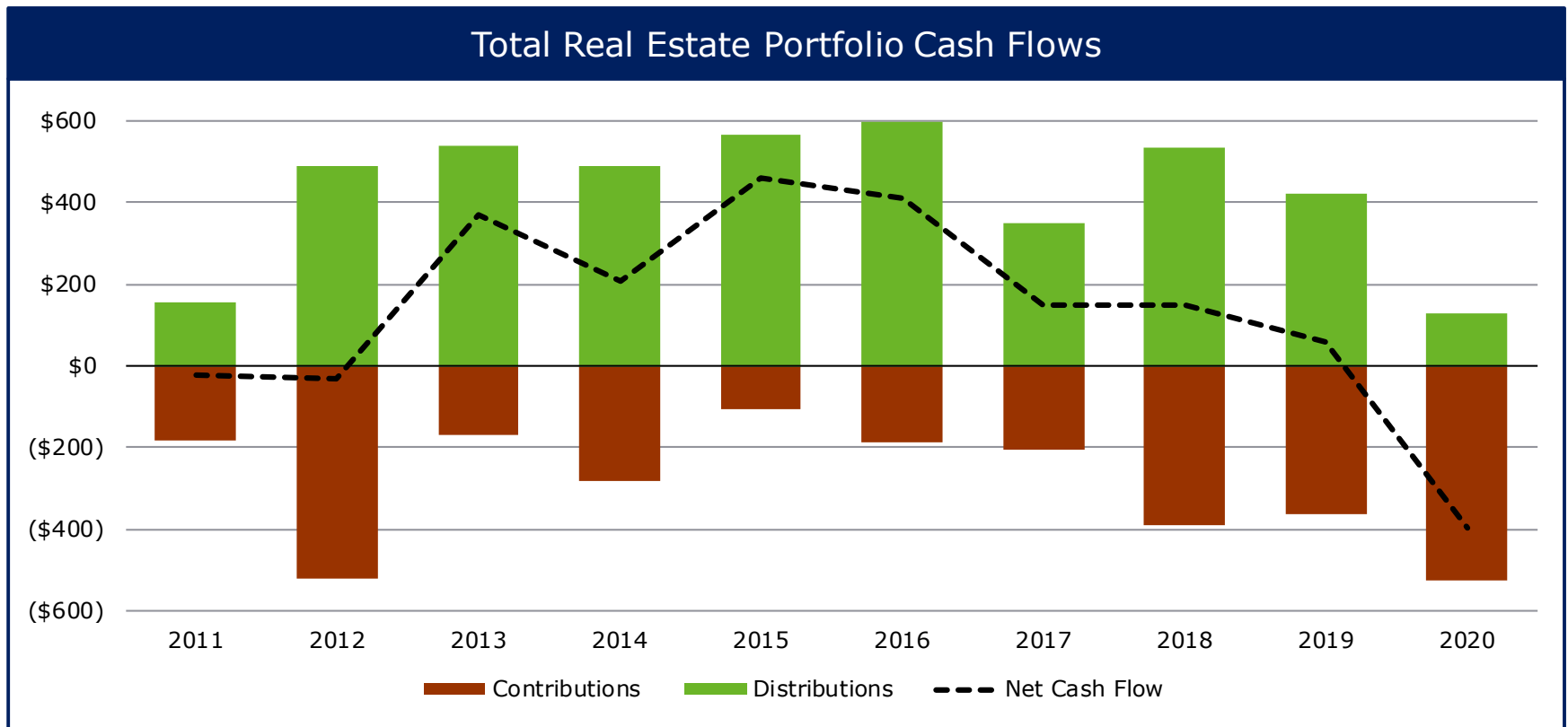
1. Vintage years 2018 and later are excluded as data is less meaningful.
2. For separate accounts, the date of initial commitment or investment is used as the vintage year.



10-YEAR CASH FLOWS

The chart below illustrates the capital invested, distributed, and net cash flows for the real estate portfolio over the past 10 calendar years

- The portfolio was cash flow positive from 2013 through 2019
- The distribution pace has slowed in 2020
 - This is likely due in part to market disruptions arising from the COVID-19 pandemic
 - Meanwhile, recent fund commitments have continued to draw capital for new investments



2. REAL ESTATE PORTFOLIO CONSTRUCTION UPDATE

NEPC, LLC

REAL ESTATE PORTFOLIO UPDATE

- **The real estate portfolio has had limited new investment activity**
 - Asset allocation changes in 2019 reduced the target allocation to real estate, thereby decreasing the expected annual commitment pace
 - Much of the activity in prior years was focused on core-plus strategies which are open-ended and therefore do not require regular annual commitments
 - In 2020, SERS committed to Oak Street Real Estate Capital Fund V and Rubicon Point Partners First Ascent
- **Capital calls outpaced distributions in 2020 as recent commitments drew capital for new investments**
 - The COVID-19 pandemic likely also impacted the pace of distributions, as real estate transaction markets slowed in 2020
- **NEPC and SERS Staff have been actively monitoring the existing portfolio, and will continue to evaluate potential investment opportunities**
 - This may include both re-ups with existing strategic partners and potential new relationships
 - With well-established core/core-plus and REIT portions of the portfolio, we remain focused on value-add and opportunistic strategies
 - Exposures to core, core-plus, and REITs will also be monitored and rebalanced (as necessary)

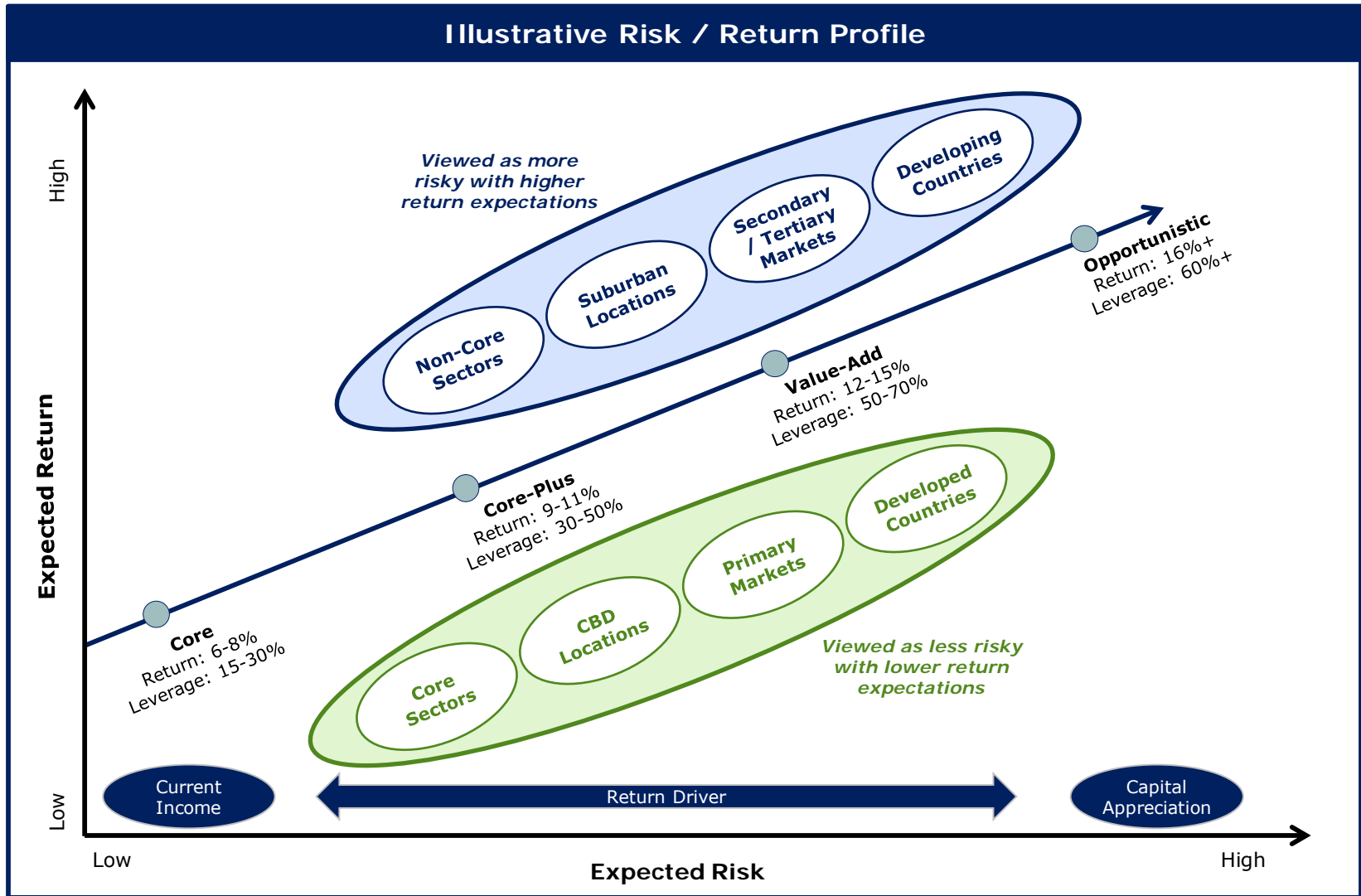
PORTFOLIO ACTIVITY SUMMARY

Real Assets Portfolio Sub-Strategy	Core/Core Plus	Value-Add/ Opportunistic	Real Estate Securities	Real Assets (Timber, Infrastructure, etc.)
Return Profile	Income Driven	Income + Capital Appreciation	Income + Capital Markets	Various
Current Exposure (NAV) (as of 12/31/20)	40%	49%	11%	< 1%
Current Target Allocation	35% +/- 20%	55% +/- 15%	10% +/- 10%	0-20%
2020-21 Activity	Maintained allocation Capital calls continue for recent commitments	Oak Street Real Estate Capital Fund V (\$50M) Rubicon First Ascent (\$50M)	Maintained allocation	Timber portfolio liquidation continued
Anticipated 2021 Activity	Staff and NEPC will evaluate the current portfolio and consider rebalancing as necessary	Staff and NEPC will continue to evaluate existing strategic relationships and potential new managers	Maintain allocation, rebalance if necessary	Removed from real estate asset class; liquidation continues

SPECTRUM OF REAL ESTATE INVESTMENT STRATEGIES

	Real Estate Investment Style / Overview	Investment Strategy	Portfolio Role	Considerations
Core Strategies	Core / Core-Plus <ul style="list-style-type: none"> Return driver: income Primary vehicle: open-end funds Historical avg. returns: 7-8% / 8%-10% Leverage: 15-40% / 40%-50% Hold period: long-term 	Stabilized income producing assets	<ul style="list-style-type: none"> Current income Broad exposure to commercial real estate (asset class beta) Inflation protection 	<ul style="list-style-type: none"> Vehicles are semi-liquid (entrance/exit queues) Limited alpha producing opportunities
	RE Securities <ul style="list-style-type: none"> Return driver: income Primary vehicle: REIT funds Historical avg. returns: 7-9% Leverage: 30-50% Hold period: long-term 	Stabilized income producing assets	<ul style="list-style-type: none"> Current income (dividends) Long-term exposure to commercial real estate (beta) Long-term inflation protection 	<ul style="list-style-type: none"> Volatility Equity correlation
Non-Core Strategies	Value-Add <ul style="list-style-type: none"> Return driver: income/appreciation Primary vehicle: varies Historical avg returns: 8-10% Leverage: 40-70% Hold period: 3-5 years 	Properties requiring lease-up, repositioning, renovation or rehabilitation	<ul style="list-style-type: none"> Provides part current income and capital appreciation Some inflation protection 	<ul style="list-style-type: none"> Vehicles are semi-liquid or illiquid Vintage year is important Higher leverage vs core Poor benchmarks
	Opportunistic <ul style="list-style-type: none"> Return driver: appreciation Primary vehicle: closed-end funds Historical avg. returns: 10-12% Leverage: 60%+ Hold period: varies 	Distressed investments, recapitalizations, development, etc.	<ul style="list-style-type: none"> Real estate alpha through capital appreciation with minimal current income 	<ul style="list-style-type: none"> Vehicles are illiquid Vintage year is important High leverage Poor benchmarks

RELATIVE EXPECTED RISK RETURN PROFILE



Notes:

- Debt-related strategies can span the illustrative risk / return spectrum depending on the specific strategy
- Manager-specific risk, operations and leverage can skew expected risk / return profile



3. REAL ESTATE MARKET UPDATE

NEPC, LLC

REAL ESTATE OUTLOOK

Real Estate Market Observations

- Divergence among winners and losers will continue
- We do not believe that “office is dead,” though there are likely to be some headwinds, and the recovery will be uneven
- Real estate capital markets are functioning properly
- Anticipate some distressed opportunities, though size of opportunity remains to be seen (substantial dry powder exists)

Actions & Client Positioning

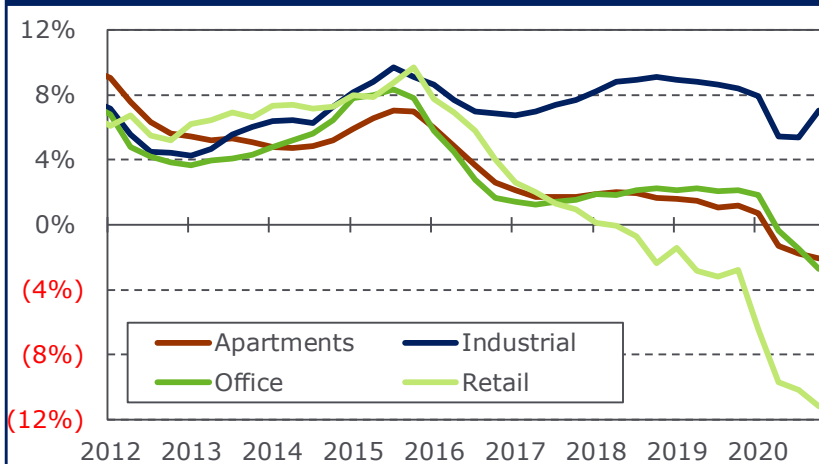
- Focus on managers with a proven ability to adapt to changing market conditions
- Identify targeted strategies that emphasize property types with strong demand tailwinds
- Look to augment existing core real estate allocations with core-plus, debt strategies, and/or REITs

OVERVIEW

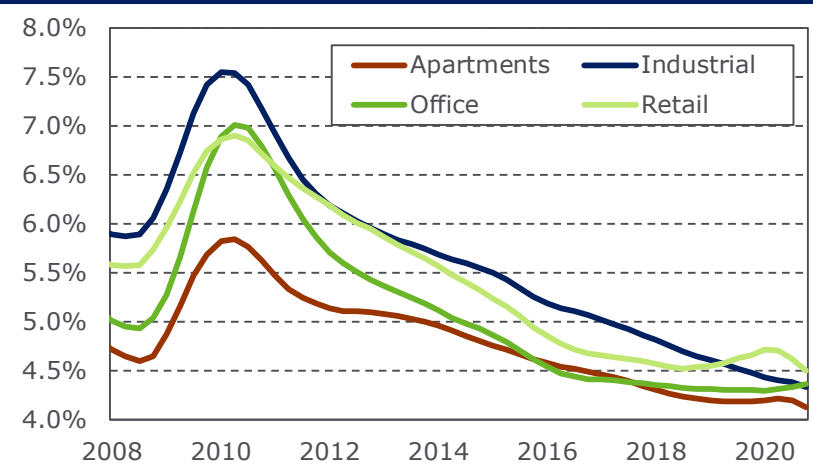
Return Trends Vary by Property Type

- **COVID had accelerated some trends, and reversed others**
 - Accelerated: eCommerce (good for industrial, bad for retail)
 - Reversed: Gateway market favorability
- **Uncertainty persists – what changes in preferences will be permanent?**
- **Expect transaction volumes to increase as lender patience wears thin**
 - May also generate attractive deal flow for distressed investors
- **Vintage years during and following periods of distress tend to perform well**
 - However, large amount of dry powder tempers expectations of broad distressed opportunities

Rolling 1-Year Appreciation Returns



Cap Rates



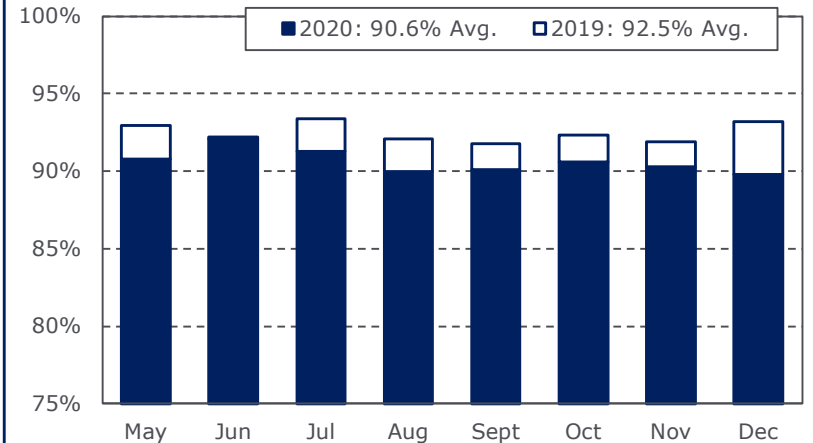
Sources: NCREIF; data as of December 31, 2020. Appreciation returns are unlevered.

RESIDENTIAL

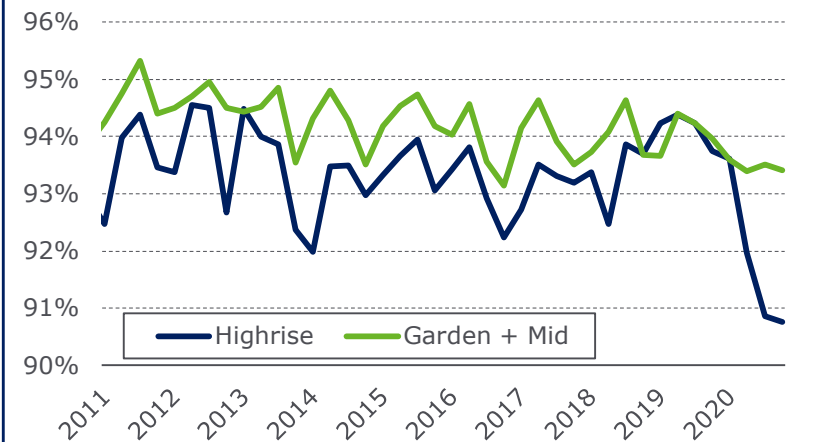
Tale of Two Markets

- **Rent collections remain generally strong nationwide**
- **Pandemic impact varies by property type, location, and tenant profile**
 - Suburban, less-dense product has performed well
 - Urban, more-dense assets have struggled
- **Class B multifamily and workforce housing remain attractive**
 - Stable demand; prices and rents less sensitive to economic growth
 - Limited new construction
- **Future trajectory of dense urban living remains challenged**
 - Most new development has been focused on urban luxury multifamily
 - Rent levels have deteriorated and vacancies ticked up in 2020
- **Single family housing is likely to benefit from current migration trends away from gateway cities**

Multifamily Rent Collections vs. 2019



Occupancy Rates Diverge



ACCELERATED SHIFT TO ECOMMERCE

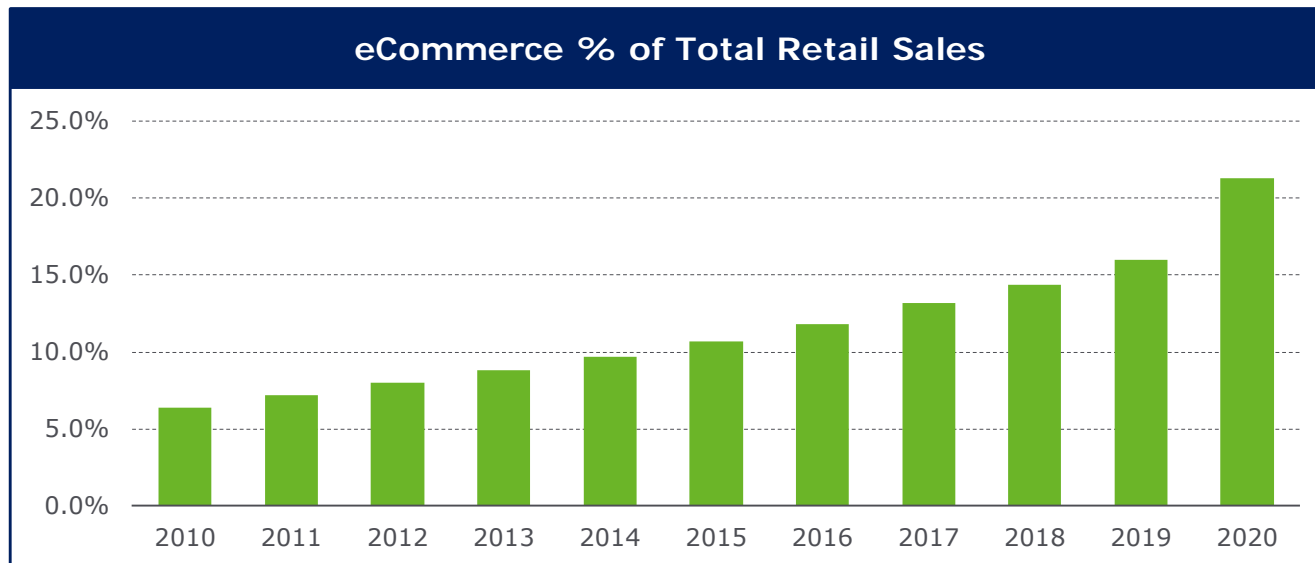
Pandemic-Driven eCommerce Growth Benefits Industrial, Challenges Retail

Industrial

- Strong demand growth and historically low vacancies fuel continued rent growth
- Competitive market; asset quality and location still matter

Retail

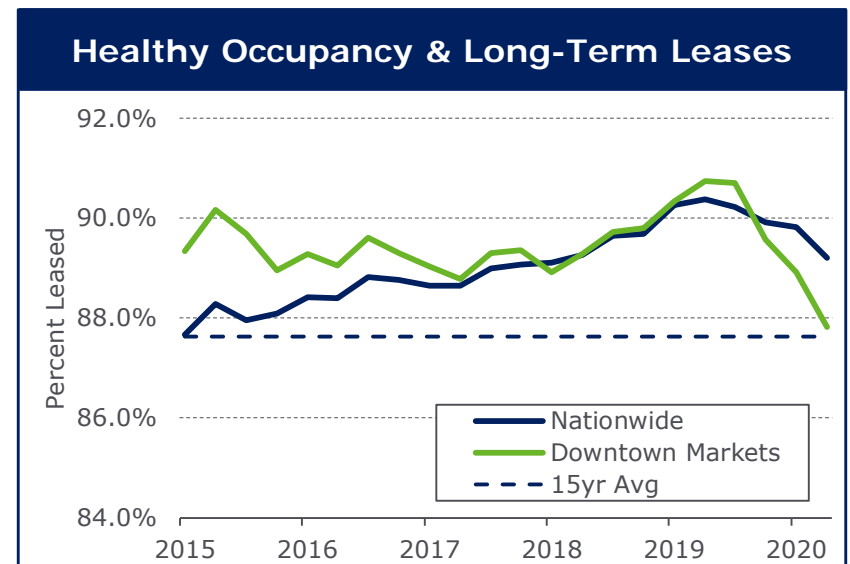
- Existing challenges were exacerbated in pandemic
- Recovery is expected... but not for all retail, and it may take a while
- Limited transaction volumes for the retail sector



Source: Digital Commerce 360 analysis of US Department of Commerce; eCommerce data excludes sales of items "not normally purchased online such as spending at restaurants, bars, automobile dealers, gas stations, and fuel dealers." As of December 31, 2020.

THE FUTURE OF OFFICE

- **Worker preferences have continued to evolve during the pandemic**
 - Employers are now determining how to re-open office space and to what extent they will bring employees back in-person
 - Both employer and employee preferences vary by industry, job function, age, and commute
 - Medical office, engineering spaces, life science/lab space, media, are among sectors with more resilient demand drivers
- **Office demand is shifting in yet-to-be determined ways**
 - Office occupancy was healthy going into 2020, and long-term leases mean that a permanent change in tenant preferences will take years to play out
 - Most expiring leases in 2020 were extended with short-term leases
- **De-densification of office space may partially offset reduction in in-person workers**
- **Clear benefits to working in an office, for both employees and employers**
- **COVID-19 pandemic merely accelerated several existing trends:**
 - Growth of non-traditional office markets (e.g., Salt Lake City, Austin, Nashville)
 - Adoption of flexible work structures (such as part-time work from home)
 - Increased the favorability of new office buildings



Source: NCREIF, as of December 31, 2020.

APPENDIX 1:
INVESTMENT LEVEL PERFORMANCE
AS OF DECEMBER 31, 2020

NEPC, LLC

ACTIVE INVESTMENTS

Investments			Trailing Period Returns (IRR) %							
Investment Name	Vintage Year	Commitment	(QTD)	(YTD)	(1 Yr)	(3 Yrs)	(5 Yrs)	(7 Yrs)	(10 Yrs)	SI IRR
Activum SG Fund VI L.P.	2019	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Activum SG Fund VI Pennsylvania Side-Car L.P.	2019	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
AG Asia Realty Fund, L.P.	2007	25,000,000								
Blackstone Property Partners, L.P.	2017	300,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Blackstone Real Estate Partners IV, L.P.	2003	25,000,000								11.94%
Blackstone Real Estate Partners V, L.P.	2006	50,000,000								10.64%
Blackstone Real Estate Partners VI, L.P.	2007	75,000,000								12.73%
Blackstone Real Estate Partners VII, L.P.	2011	75,000,000								14.50%
Blue Moon Senior Housing II Sidecar L.P.	2019	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Blue Moon Senior Housing II, L.P.	2019	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
BPG Investment Partnership IX, L.P.	2012	25,000,000								
BPG Investment Partnership V, L.P.	1999	25,000,000								
BPG Investment Partnership VI, L.P.	2002	25,000,000								
BPG Investment Partnership VII, L.P.	2005	25,000,000								
BPG Investment Partnership VIII, L.P.	2007	15,588,238								
C-III Recovery Fund III, L.P.	2017	100,000,000	NM	NM	NM	NM	NM	NM	NM	NM
CenterSquare Real Estate Securities	2002	183,616,773	11.95%	-4.11%	-4.11%	6.30%	6.54%	8.41%	9.50%	10.70%
Clerestory Small Cap Real Estate Fund I - TE, L.P.	2010	18,000,000								
Colony Investors VIII, L.P.	2007	22,500,000								
Forest Separate Account	1992	124,231,969								
Heitman America Real Estate Trust, L.P.	2007	100,000,000								
Heitman Separate Account	1988	813,635,039								
Henderson Park Enhanced Income Fund, SCSp	2019	300,000,000	NM	NM	NM	NM	NM	NM	NM	NM
HotelAVE Separate Account	2018	59,048,685	NM	NM	NM	NM	NM	NM	NM	NM
LaSalle Separate Account	1994	453,286,021	-1.10%	-8.86%	-8.86%	6.93%	6.07%	8.81%	14.29%	9.45%
Lasalle Takeover Account	2018	262,690,475	NM	NM	NM	NM	NM	NM	NM	NM
LEM Real Estate High-Yield Debt & Preferred Equity Fund III, L.P.	2013	25,000,000		-2.01%	-2.01%	17.63%	19.68%	21.81%		23.66%
Low GTO Separate Account	2012	349,069,212								
Low GTO Separate Account	1994	715,229,496								
Lubert-Adler Real Estate Fund VII, L.P.	2014	25,000,000	-4.18%	-19.79%	-19.79%	-1.01%	2.72%			2.01%
Mesirow Financial Real Estate Value Fund III, L.P.	2018	25,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Oak Street Real Estate Capital Fund IV, L.P.	2017	100,000,000								
Oak Street Real Estate Capital Fund V, L.P.	2020	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Oak Street Real Estate Capital Net Lease Property Fund, L.P.	2018	300,000,000	NM	NM	NM	NM	NM	NM	NM	NM
PLA Residential Fund III, L.P.	2008	29,654,968								
PLA Retail Fund I, L.P.	2006	25,000,000								
Rockpoint Finance Fund I, L.P.	2007	50,000,000								
Rockpoint Real Estate Fund II, L.P.	2005	35,000,000								
Rockpoint Real Estate Fund III, L.P.	2007	50,000,000								



Data as of December 31, 2020.

NM - Not Meaningful

ACTIVE INVESTMENTS (CONTINUED)

Investments			Trailing Period Returns (IRR) %							
Investment Name	Vintage Year	Commitment	(QTD)	(YTD)	(1 Yr)	(3 Yrs)	(5 Yrs)	(7 Yrs)	(10 Yrs)	SI IRR
Rockpoint Real Estate Fund V, L.P.	2015	50,000,000								
Rubicon First Ascent, L.P.	2020	30,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Rubicon First Ascent Sidecar, L.P.	2020	20,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Scout Fund I-A, L.P.	2009	75,000,000	5.21%	26.36%	26.36%	52.64%	65.20%	7.63%	16.48%	15.31%
Scout Fund II-A, L.P.	2016	30,000,000	4.52%	-4.22%	-4.22%	4.08%				3.75%
Senior Housing Partners IV, L.P.	2011	25,000,000								
Senior Housing Partners V, L.P.	2015	50,000,000								
Senior Housing Partners VI, L.P.	2019	100,000,000	NM	NM	NM	NM	NM	NM	NM	NM
SRE Opportunity Fund III Select, L.P.	2018	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
SRE Opportunity Fund III, L.P.	2018	50,000,000	NM	NM	NM	NM	NM	NM	NM	NM
Starwood Global Opportunity Fund VII-A, L.P.	2006	35,000,000								
Starwood Global Opportunity Fund VIII, L.P.	2009	50,000,000								
Starwood Opportunity Fund VI, L.P.	2001	50,000,000								
Trumbull Property Fund, L.P.	1988	25,558,525	-2.11%	-4.84%	-4.84%	1.09%	3.53%	6.22%	7.98%	6.84%
ValStone Opportunity Fund V, LLC	2014	14,663,402	-0.75%	-0.27%	-0.27%	7.31%	7.66%			8.17%
Westbrook Real Estate Fund V, L.P.	2004	25,000,000	-20.64%	-4.21%	-4.21%	11.76%	5.41%	27.90%	18.70%	43.55%
Westbrook Real Estate Fund VI, L.P.	2006	35,000,000	-0.06%	-0.20%	-0.20%	-0.95%	-0.53%	9.55%	8.75%	0.24%
Westbrook Real Estate Fund VII, L.P.	2007	50,000,000	-0.53%	-14.51%	-14.51%	-6.15%	-2.10%	3.64%	11.56%	2.25%
Westbrook Real Estate Fund VIII, L.P.	2009	50,000,000	-6.60%	-23.29%	-23.29%	-8.49%	-4.13%	3.42%	9.96%	10.05%
Total										



Data as of December 31, 2020.

NM - Not Meaningful

PERFORMANCE BY STRATEGY

Investments		Commitments		Contributions & Distributions			Valuations			Performance		
Investment Name	Vintage Year	Commitment	Unfunded Commitment	Paid In Capital	Additional Fees	Cumulative Distributions	Valuation	Total Value	Net Benefit	DPI	TVPI	IRR
Core												
Heitman America Real Estate Trust, L.P.	2007	\$100,000,000	\$0	\$100,000,000		\$84,491,635						
Trumbull Property Fund, L.P.	1988	\$25,558,525	\$0	\$25,558,525	\$341,174	\$115,219,651	\$28,356,681	\$143,576,332	\$117,676,633	4.45	5.54	6.84%
Total Core		\$125,558,525	\$0	\$125,558,525		\$199,711,286						
Core Plus												
Blackstone Property Partners, L.P.	2017	\$300,000,000	\$0	\$300,000,000	NM	\$1,744,007	NM	NM	NM	NM	NM	NM
Henderson Park Enhanced Income Fund, SCSp	2019	\$334,661,110	\$45,015,807	\$289,645,303	NM	\$9,843,419	NM	NM	NM	NM	NM	NM
Oak Street Real Estate Capital Net Lease Property Fund, L.P.	2018	\$300,000,000	\$88,328,633	\$211,671,367	NM	\$6,219,836	NM	NM	NM	NM	NM	NM
Total Core Plus		\$934,661,110	\$133,344,440	\$801,316,670		\$17,807,262						
Direct Investment												
Heitman Separate Account	1988	\$813,635,039	\$0	\$813,635,039		\$1,092,759,873						
HotelAVE Separate Account	2018	\$59,048,685	\$0	\$59,048,685	NM	\$20,191,396	NM	NM	NM	NM	NM	NM
LaSalle Separate Account	1994	\$453,286,021	\$0	\$453,286,021		\$778,848,456	\$167,906,673	\$946,755,129		1.71	2.07	9.45%
Lasalle Takeover Account	2018	\$262,690,475	\$0	\$262,690,475	NM	\$28,593,427	NM	NM	NM	NM	NM	NM
Low GTO Separate Account	2012	\$349,069,212	\$0	\$349,069,212		\$370,075,373						
Low Separate Account	1994	\$715,229,496	\$0	\$715,229,496		\$1,072,507,833						
Total Direct Investment		\$2,652,958,927	\$0	\$2,652,958,927		\$3,362,976,358						
REIT												
CenterSquare Real Estate Securities	2002	\$183,616,773	\$0	\$183,616,773		\$36,168,336	\$271,659,616	\$307,827,952		0.20	1.68	10.70%
Total REIT		\$183,616,773	\$0	\$183,616,773		\$36,168,336						
Timber												
Forest Separate Account	1992	\$124,231,969	\$0	\$124,231,969		\$242,667,376						
Total Timber		\$124,231,969	\$0	\$124,231,969		\$242,667,376						
Value Add												
Blue Moon Senior Housing II Sidecar L.P.	2019	\$50,000,000	\$29,007,959	\$20,992,041	NM	\$0	NM	NM	NM	NM	NM	NM
Blue Moon Senior Housing II, L.P.	2019	\$50,000,000	\$28,837,854	\$21,162,146	NM	\$0	NM	NM	NM	NM	NM	NM
BPG Investment Partnership IX, L.P.	2012	\$25,000,000	\$696,591	\$24,303,409		\$37,778,298						
BPG Investment Partnership V, L.P.	1999	\$24,136,964	\$0	\$24,136,964		\$43,949,316						
BPG Investment Partnership VI, L.P.	2002	\$24,543,712	\$0	\$24,543,712		\$42,799,870						
BPG Investment Partnership VII, L.P.	2005	\$25,000,000	\$0	\$25,000,000		\$14,360,030						
BPG Investment Partnership VIII, L.P.	2007	\$15,588,238	\$676,220	\$14,912,018		\$20,049,072						
Lubert-Adler Real Estate Fund VII, L.P.	2014	\$25,000,000	\$2,179,554	\$22,820,446	\$0	\$8,170,946	\$16,675,707	\$24,846,653	\$2,026,207	0.36	1.09	2.01%
Mesirow Financial Real Estate Value Fund III, L.P.	2018	\$25,145,833	\$2,018,162	\$23,127,672	NM	\$1,018,965	NM	NM	NM	NM	NM	NM
Oak Street Real Estate Capital Fund IV, L.P.	2017	\$100,000,000	\$0	\$100,000,000	\$0	\$22,264,833						
Oak Street Real Estate Capital Fund V, L.P.	2020	\$50,000,000	\$37,340,000	\$12,660,000	NM	\$75,328	NM	NM	NM	NM	NM	NM
Westbrook Real Estate Fund V, L.P.	2004	\$25,000,000	\$0	\$25,000,000	\$2,259,023	\$52,005,779	\$55,204	\$52,060,983	\$24,801,960	1.91	1.91	43.55%
Westbrook Real Estate Fund VI, L.P.	2006	\$35,000,000	\$0	\$35,000,000	\$3,550,099	\$37,571,397	\$1,419,163	\$38,990,560	\$440,461	0.97	1.01	0.24%
Westbrook Real Estate Fund VII, L.P.	2007	\$50,000,000	\$0	\$50,000,000	\$6,209,866	\$52,787,877	\$11,531,496	\$64,319,373	\$8,109,507	0.94	1.14	2.25%
Westbrook Real Estate Fund VIII, L.P.	2009	\$50,000,000	\$0	\$50,000,000	\$4,208,679	\$63,418,319	\$7,358,269	\$70,776,588	\$16,567,909	1.17	1.31	10.05%
Total Value Add		\$574,414,747	\$100,756,339	\$473,658,408		\$396,250,029						

NM - Not Meaningful

Data as of December 31, 2020.

1 - Note that "Additional Fees" includes paid-in capital that does *not* reduce the unfunded commitment amount; this may include, among other items, management fees which are paid outside of the fund commitment, taxes, and closing interests paid to LPs in earlier closes. A negative number in this column indicates that SERS received (rather than paid-in) capital; a negative number is typically, though not exclusively, due to SERS receiving closing interests from LPs in later closes.



PERFORMANCE BY STRATEGY (CONTINUED)

Investments		Commitments		Contributions & Distributions			Valuations			Performance		
Investment Name	Vintage Year	Commitment	Unfunded Commitment	Paid In Capital	Additional Fees	Cumulative Distributions	Valuation	Total Value	Net Benefit	DPI	TVPI	IRR
Opportunistic												
Activum SG Fund VI L.P.	2019	\$60,675,147	\$51,114,016	\$9,561,131	NM	\$0	NM	NM	NM	NM	NM	NM
Activum SG Fund VI Pennsylvania Side-Car L.P.	2019	\$60,675,147	\$60,675,147	\$0	NM	\$0	NM	NM	NM	NM	NM	NM
AG Asia Realty Fund, L.P.	2007	\$25,000,000	\$1,500,000	\$23,500,000		\$25,375,000				1.08		
Blackstone Real Estate Partners IV, L.P.	2003	\$25,000,000	\$0	\$25,000,000	\$0	\$40,257,893	\$835,734	\$41,093,627	\$16,093,627	1.61	1.64	11.94%
Blackstone Real Estate Partners V, L.P.	2006	\$50,000,000	\$2,087,026	\$47,912,974	\$0	\$97,344,784	\$1,625,706	\$98,970,490	\$51,057,516	2.03	2.07	10.64%
Blackstone Real Estate Partners VI, L.P.	2007	\$75,000,000	\$3,680,925	\$71,319,075	\$281,339	\$151,561,087	\$3,162,404	\$154,723,491	\$83,123,077	2.12	2.16	12.73%
Blackstone Real Estate Partners VII, L.P.	2011	\$75,000,000	\$8,413,088	\$66,586,912	\$2,190,434	\$94,086,928	\$29,520,930	\$123,607,858	\$54,830,512	1.37	1.80	14.50%
C-III Recovery Fund III, L.P.	2017	\$100,000,000	\$39,498,786	\$60,501,214	NM	\$0	NM	NM	NM	NM	NM	NM
Clerestory Small Cap Real Estate Fund I - TE, L.P.	2010	\$18,000,000	\$2,771,044	\$15,228,956		\$15,131,513						
Colony Investors VIII, L.P.	2007	\$22,500,000	\$844,200	\$21,655,800		\$7,962,017						
LEM Real Estate High-Yield Debt & Preferred Equity Fund III, L.P.	2013	\$25,000,000	\$0	\$25,000,000	\$0	\$47,553,705	\$0	\$47,553,705	\$22,553,705	1.90	1.90	23.66%
PLA Residential Fund III, L.P.	2008	\$29,654,968	\$4,946,219	\$24,708,749		\$13,444,991	\$253,732	\$13,698,723		0.54		
PLA Retail Fund I, L.P.	2006	\$2,271,117	\$0	\$2,271,117		\$8,162,626	\$394,487	\$8,557,113		3.59		
Rockpoint Finance Fund I, L.P.	2007	\$2,527,500	\$0	\$2,527,500		\$2,315,090				0.52		
Rockpoint Real Estate Fund II, L.P.	2005	\$34,138,784	\$0	\$34,138,784		\$30,679,156				0.82		
Rockpoint Real Estate Fund III, L.P.	2007	\$50,632,887	\$4,241,165	\$46,391,722		\$67,236,003				1.33		
Rockpoint Real Estate Fund V, L.P.	2015	\$50,000,000	\$9,357,339	\$40,642,661		\$14,060,814				0.32		
Rubicon First Ascent, L.P.	2020	\$30,000,000	\$30,000,000	\$0	NM	\$0	NM	NM	NM	NM	NM	NM
Rubicon First Ascent Sidecar, L.P.	2020	\$20,000,000	\$20,000,000	\$0	NM	\$0	NM	NM	NM	NM	NM	NM
Scout Fund I-A, L.P.	2009	\$75,000,000	\$0	\$75,000,000	\$0	\$117,006,454	\$794,353	\$117,800,807	\$42,800,807	1.56	1.57	15.31%
Scout Fund II-A, L.P.	2016	\$30,000,000	\$0	\$30,000,000	\$0	\$605,865	\$33,235,526	\$33,841,391	\$3,841,391	0.02	1.13	3.75%
Senior Housing Partners IV, L.P.	2011	\$22,089,297	\$1,289,781	\$20,799,516		\$37,182,609	\$689,535	\$37,872,144		1.79		
Senior Housing Partners V, L.P.	2015	\$50,000,000	\$8,862,310	\$41,137,690		\$3,216,633	\$50,431,346	\$53,647,978		0.08		
Senior Housing Partners VI, L.P.	2019	\$100,000,000	\$83,576,467	\$16,423,533	NM	\$0	NM	NM	NM	NM	NM	NM
SRE Opportunity Fund III Select, L.P.	2018	\$50,000,000	\$29,250,000	\$20,750,000	NM	\$0	NM	NM	NM	NM	NM	NM
SRE Opportunity Fund III, L.P.	2018	\$50,000,000	\$26,750,000	\$23,250,000	NM	\$5,500,000	NM	NM	NM	NM	NM	NM
Starwood Global Opportunity Fund VII-A, L.P.	2006	\$35,000,000	\$0	\$35,000,000		\$27,295,581						
Starwood Global Opportunity Fund VIII, L.P.	2009	\$50,000,000	\$4,643,719	\$45,356,281		\$69,104,967						
Starwood Opportunity Fund VI, L.P.	2001	\$50,000,000	\$0	\$50,000,000		\$51,927,126						
ValStone Opportunity Fund V, LLC	2014	\$14,663,402	\$0	\$14,663,402	\$375	\$5,009,834	\$16,477,038	\$21,486,872	\$6,823,095	0.34	1.47	8.17%
Total Opportunistic		\$1,282,828,249	\$393,501,232	\$889,327,018		\$932,020,676						
Total		\$5,878,270,300	\$627,602,011	\$5,250,668,290		\$5,187,601,324						

NM - Not Meaningful

Data as of December 31, 2020.

1 - Note that "Additional Fees" includes paid-in capital that does *not* reduce the unfunded commitment amount; this may include, among other items, management fees which are paid outside of the fund commitment, taxes, and closing interests paid to LPs in earlier closes. A negative number in this column indicates that SERS received (rather than paid-in) capital; a negative number is typically, though not exclusively, due to SERS receiving closing interests from LPs in later closes.



APPENDIX 2: DISCLAIMERS & DISCLOSURES

NEPC, LLC

DISCLAIMER

- **Past performance is no guarantee of future results.**
- **The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.**
- **Information used to prepare this report was obtained directly from the investment managers or custodians, and market index data was provided by other external sources. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.**
- **This report may contain confidential or proprietary information and may not be copied or redistributed to any party not legally entitled to receive it.**

ALTERNATIVE INVESTMENT DISCLOSURES

In addition, it is important that investors understand the following characteristics of non-traditional investment strategies including hedge funds, real estate and private equity:

1. Performance can be volatile and investors could lose all or a substantial portion of their investment
2. Leverage and other speculative practices may increase the risk of loss
3. Past performance may be revised due to the revaluation of investments
4. These investments can be illiquid, and investors may be subject to lock-ups or lengthy redemption terms
5. A secondary market may not be available for all funds, and any sales that occur may take place at a discount to value
6. These funds are not subject to the same regulatory requirements as registered investment vehicles
7. Managers may not be required to provide periodic pricing or valuation information to investors
8. These funds may have complex tax structures and delays in distributing important tax information
9. These funds often charge high fees
10. Investment agreements often give the manager authority to trade in securities, markets or currencies that are not within the manager's realm of expertise or contemplated investment strategy