

# REIT Valuation

## A Big Change in Our Pricing Model



October 15, 2019

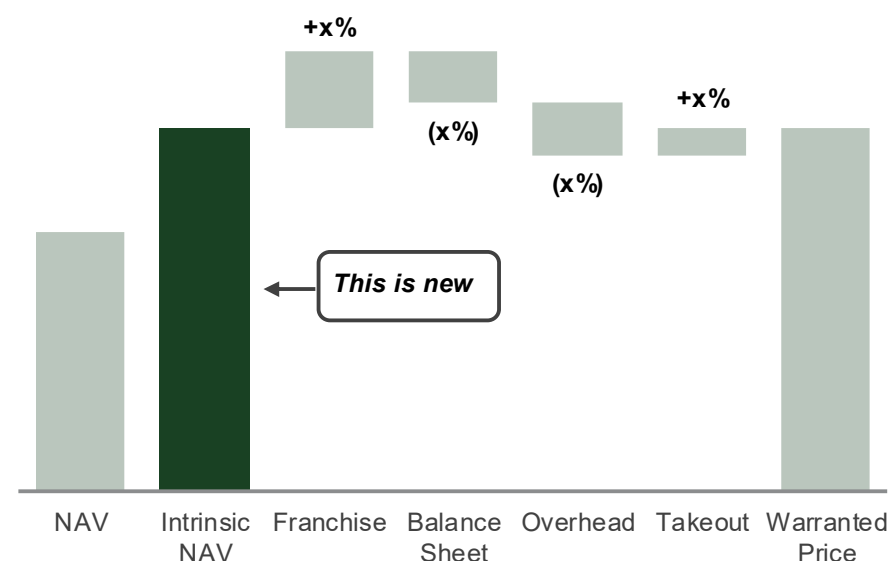
DJIA: **27,024** | RMZ: **1301** | 10-Year T-Note: **1.77%**

### An Intrinsic Improvement

Our REIT Pricing Model has served as the backbone of our stock selection process for three decades. The model is designed to assess relative valuations; i.e., it identifies the REITs that are most/least attractively valued on a market- and sector-neutral basis. The model's logic and the discipline it enforces are as relevant today as ever, and those features remain unchanged.

A big change is being made, however, via the replacement of NAV with Intrinsic NAV as the most important determinant of warranted share price. Intrinsic NAV assesses how each property portfolio *should* be valued, rather than relying solely on signals from the private market. It is generated by an in-depth analysis of return expectations for each portfolio. The revamped approach better focuses on valuation issues that are important to public investors, while ignoring some of the quirks that can afflict private pricing.

### A New Step in Translating NAV into Warranted Price



### Important disclosure on pages 18-19

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*The results presented herein are based on pricing as of October 14, 2019: RMZ = 1297; DJIA = 26,787; 10YR T-Note = 1.72%*

# Executive Summary

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## Discipline is a Virtue

- Our REIT pricing model has guided Buy/Hold/Sell recommendations for decades
- It has played an instrumental role in Green Street's successful stock-picking track record
- The model enforces a disciplined and consistent approach across all property sectors
- Compartmentalized nature of the approach ensures that all relevant valuation issues are considered
- Relative valuation model: roughly equal number of buys and sells in every property sector

## A Big Change

- U.S. model is now based on intrinsic NAV, which is driven by the IRR of the property portfolio
- Intrinsic NAV addresses how the portfolio should be valued vs. peers; NAV assesses how it is valued
- Warranted share price = intrinsic NAV plus/minus a premium for future value added by management
- G&A, franchise value, balance sheet risk and takeout price/odds impact the size of the premium
- Corp governance scores no longer a direct input, but indirectly included...they influence takeout odds
- Other factors – such as REITrader signals – can also impact warranted prices

## Why Change?

- NAV has long anchored the model, but private-market quirks make intrinsic NAV more useful
- Private investors place a high premium on gateway trophies; public investors justifiably do not
- Private investors confuse liquidity with low risk; public investors correctly disagree
- Expansion of Green Street product line means high-quality inputs are now available for IRR models
- Franchise value no longer fudges for property pricing views – now a pure grade on management
- NAV is still an important metric; Green Street's will continue to be the "gold standard"

## The Output

- Minimal change to most warranted share prices...we've been using the new model in the background
- Intrinsic NAV higher than NAV for non-gateway office and network-dense data centers

# Overview: REIT Investing, One Question at a Time

**A Key Driver of Success:** Green Street's Intrinsic NAV pricing model is designed to assess the valuation of any REIT relative to property-sector peers. The discipline imposed by a model of this sort has played a key role in our successful recommendation track record. While the model is designed to be neutral with regard to whether REITs in aggregate are cheap or expensive, investors can employ other Green Street analytic tools to help assess overall valuation and/or sector allocation issues.

## Company Research

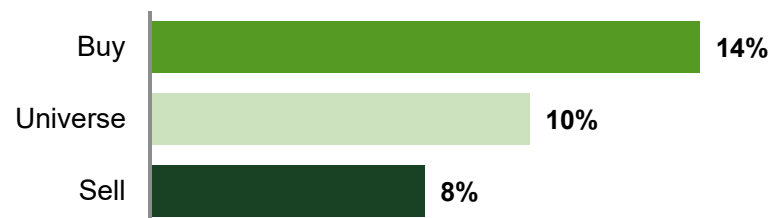
### Intrinsic NAV Pricing Model

Intrinsic NAV  
+ Warranted Premium  
= Warranted Share Price

### Stock Recommendations

Green Street's Pricing Model, coupled with heavy analyst input, drives our recommendations. The recommendations are market and sector neutral.

#### 7-Year Ann. Return of Green St Recs\*



## Macro & Sector Research

### Overall REIT Valuation

The **RMZ Forecast Tool**, published monthly, assesses overall REIT valuation vs. bonds and stocks. It has proven very helpful in identifying periods when REITs are badly mis-priced.

### Property Sector Allocation

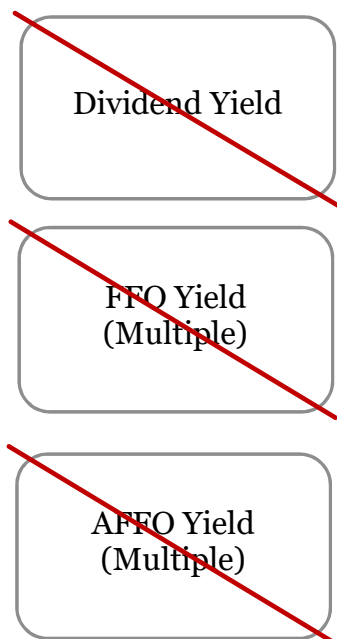
A deep dive into which property sectors offer the most attractive valuations for investors with long-term investment horizons is published every few years (Sector Allocation: Version 3.0 8/15/19 was latest). It is based on extensive research into long-term sector performance and cap-ex requirements. An update of the analysis is included each month in the **Real Estate Securities Monthly**.

\* Annualized total return from Oct 1, 2012 to Sept 30, 2019. See recommendation track record disclosure on page 19.

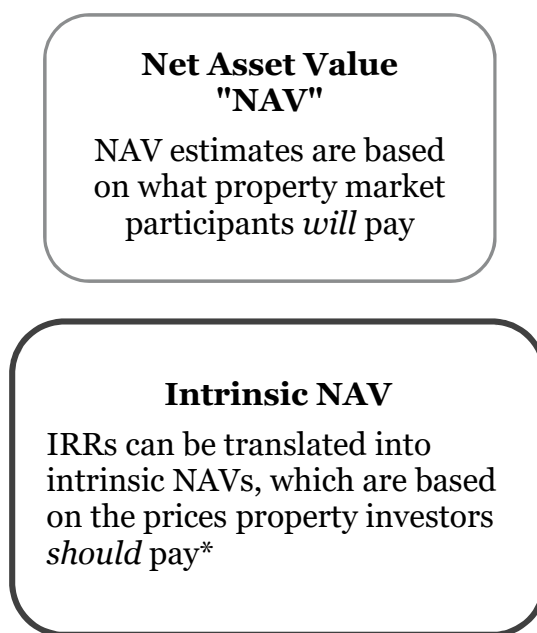
# Overview: Why Use IRR?

**Because We Can:** Most equity investors focus a great deal of attention on P/E multiples and/or yields, so it is fair to question why REIT investors should use other metrics. The answer is because the lion's share of the value of any REIT lies in its real estate portfolio and good alternatives exist for valuing real estate. NAV, based on the marked-to-market value of the property portfolio, provides one good approach, and intrinsic NAV, which is based on the unlevered IRR likely to be generated by the portfolio is another. Intrinsic NAVs adjust for quirks/inefficiencies in private-market pricing that public investors should (and do) ignore.

## Too Simplistic



## Far Better



## There is More to it Than Just Intrinsic NAV

Compartmentalized Analysis Looks at All Relevant Factors

### Intrinsic NAV: The Starting Point



### The Warranted Premium:

Warranted premiums are applied to gross (a.k.a. unlevered) asset value and are a function of:

- Premiums ascribed by the market to other REITs in the same property sector
- Franchise value
- Balance sheet risk
- Overhead (G&A expenses)
- Takeout odds
- Subjective (e.g., strong REITrader signal)



### Warranted Share Price

Used to compare valuations *relative* to those of other REITs in the same property sector

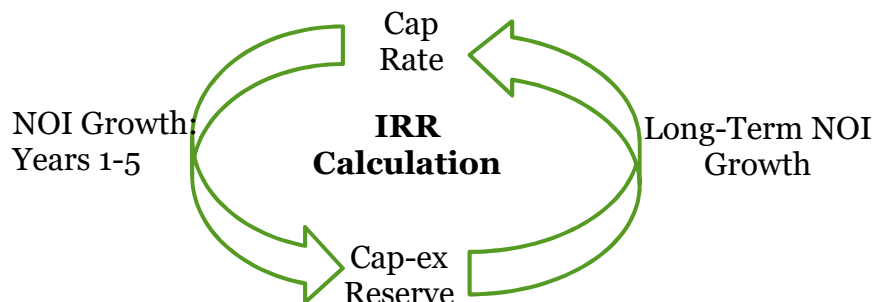


\* Intrinsic property price/NAV is the fair price relative to the properties of the other REITs in the sector (e.g., fair value of BXP's portfolio vs. other office REITs).

# Overview: What is Intrinsic NAV?

**Output is Only as Good as the Inputs:** Thoughtfully derived estimates of IRR for each REIT portfolio require a lot of resources. Our estimates of intermediate- and long-term growth rates for each REIT portfolio are shaped by the rent and occupancy forecasts in core sectors across 50 markets provided by our Real Estate Analytics team. Cap-ex inputs are informed by Green Street's extensive body of research on the topic. Ultimate control over the calculation rests with our deep team of REIT analysts.

## Calculating IRR of REIT Portfolios



## Translating IRR into Intrinsic Asset Value

REITs with highest risk-adjusted IRRs\* in a sector deserve positive adjustment to private-market value, and vice versa...

### Intrinsic Asset Value: An Example

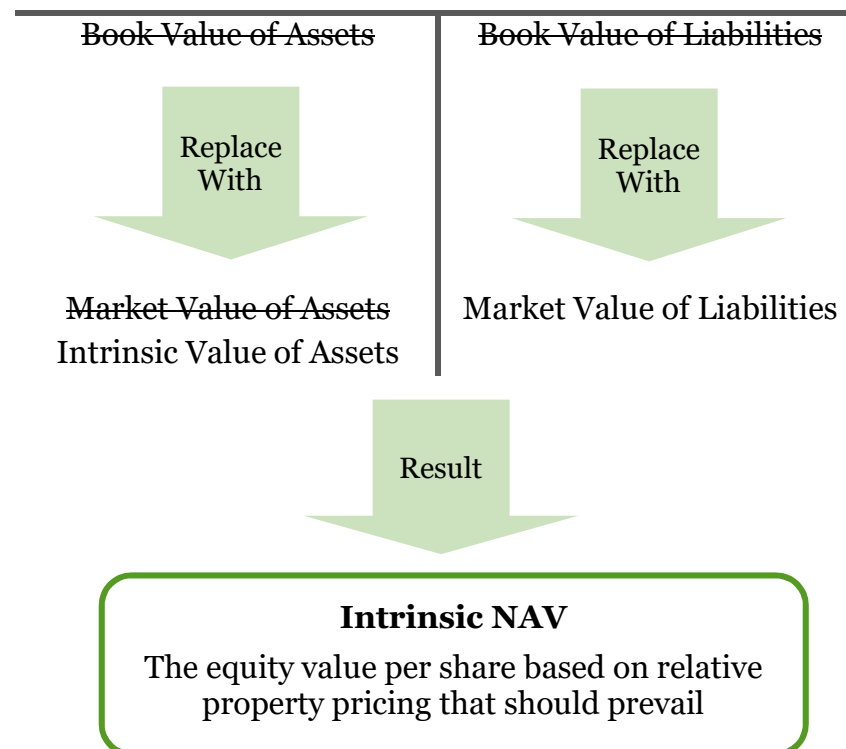
A REIT's portfolio offers a 6.6% IRR vs a sector avg of 6.0%

$$\text{Intrinsic Asset Value} = \text{Private-Mkt Asset Value} \times \frac{6.6\%}{6.0\%} \text{ or } 110\%$$

\* Adjusted for differences in market risk, e.g., San Francisco apartments are riskier/higher beta than Sunbelt apartments













Math in example is an approximation. Change in value will depend on the components of the 6.6% return (i.e., how much is initial yield vs. growth).

## Intrinsic Value Balance Sheet



## Overview: Why Intrinsic NAV Instead of NAV?

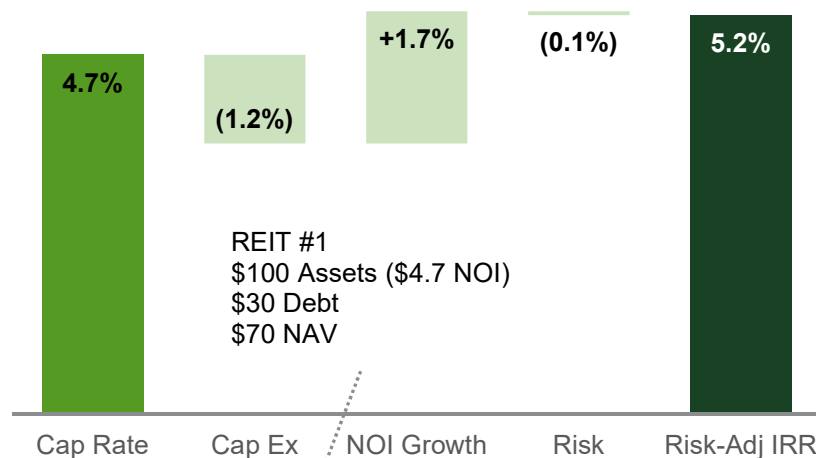
**Two Good Approaches:** Until a few years ago, Green Street had relied primarily on an NAV-based pricing model. The prior aversion to using an IRR-based approach rested on concerns about the quality of the inputs, rather than any philosophical distaste. The growth of our Real Estate Analytics product line has increased the confidence that should be accorded to many of the underlying IRR assumptions, such as rent and occupancy growth across markets. At the same time, some of the weaknesses of an NAV-based approach have become more glaring in recent years.

	NAV Model	Intrinsic NAV Model
Based on Pricing Signals from Private Market		
Good for Comparing Very Similar REITs (e.g., EQR vs. AVB or VNO vs. SLG)		
Good for Comparing REITs Across Different Markets		
Appropriately Ignores Private-Market Biases (e.g., the Preference for Gateway/Trophy and Liquidity)		
Takes advantage of info that is proprietary and/or not well understood throughout the market		
Good for Comparing REITs Across Different Sectors		

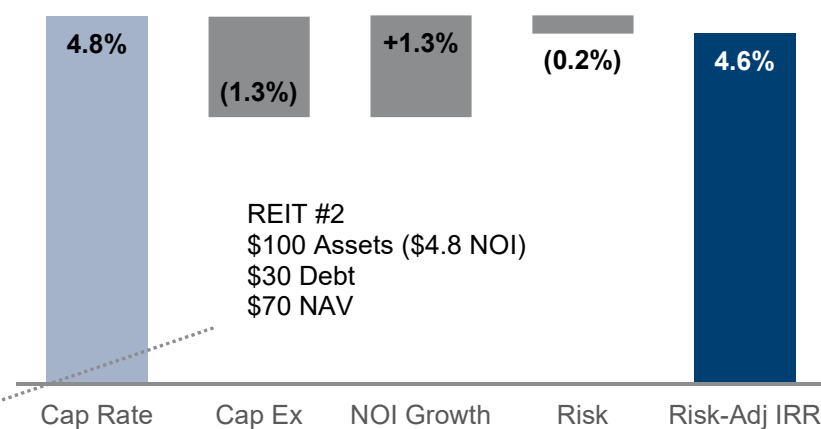
## Overview: NAV and Intrinsic NAV Can Diverge

**The West is Best:** Nominal office cap rates in West LA and Midtown Manhattan are quite similar, but West LA offers considerably better returns. LA has lower cap-ex and a superior near-term growth profile. Long-term growth should also be better due to extreme NIMBYism. Likely explanations for the stickiness of low cap rates in NY include an undue emphasis on big, trophy assets by some investors, as well as a common misperception that liquidity equates to low risk. The opposite is actually true: New York is a risky market. In a downturn, values are likely to decline more than average.\*

The Derivation of Return Expectations: LA Office REIT



The Derivation of Return Expectations: NY Office REIT



The two REITs offer similar first-year yields (Net Operating Income is about the same), but the LA REIT offers better growth, is less risky, and requires less cap ex. In short, it is a better investment. Intrinsic asset value and NAV account for this.

The intrinsic asset value of the LA REIT is 15% higher than that of the NY REIT. On a levered basis that translates into an Intrinsic NAV that is almost 25% higher.

*Large gaps between NAV and Intrinsic NAV can persist for a long time, but Intrinsic NAV is still the more relevant metric*

\* Market risk is discussed in Property Insights: Calculated Risk, Jan 10, 2019

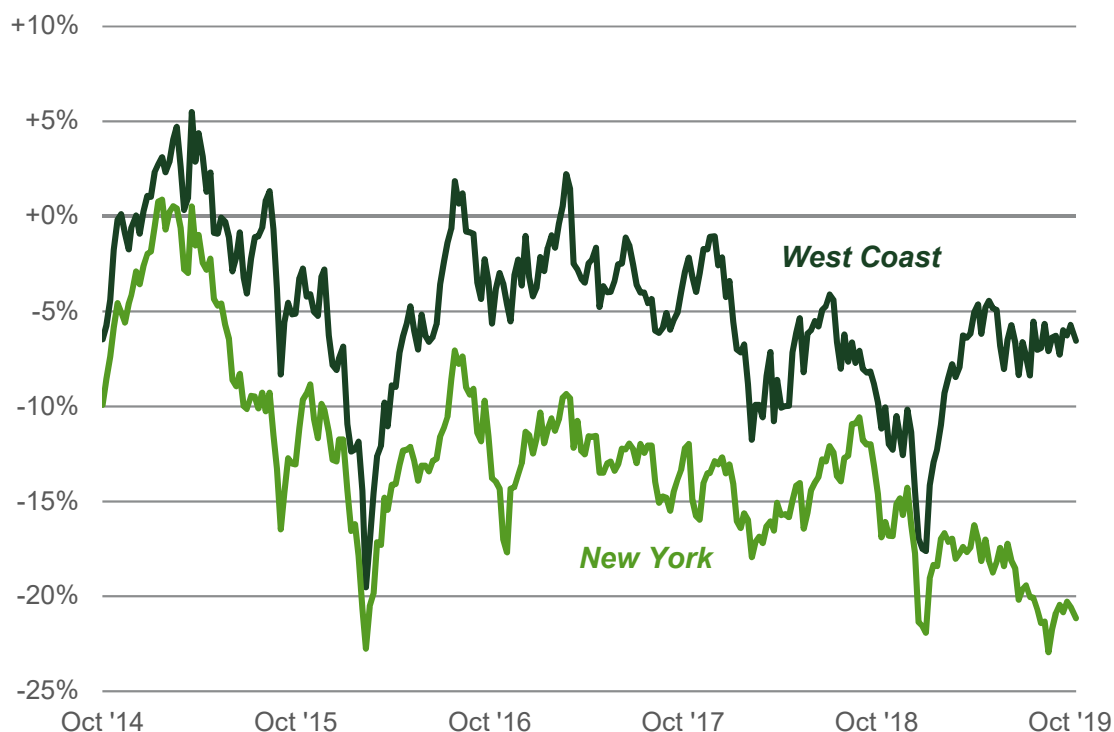
Data shown for LA is based on cap rates & growth outlook for Douglas Emmett (DEI). NY is SL Green. DEI owns some apartment properties (15% of assets).



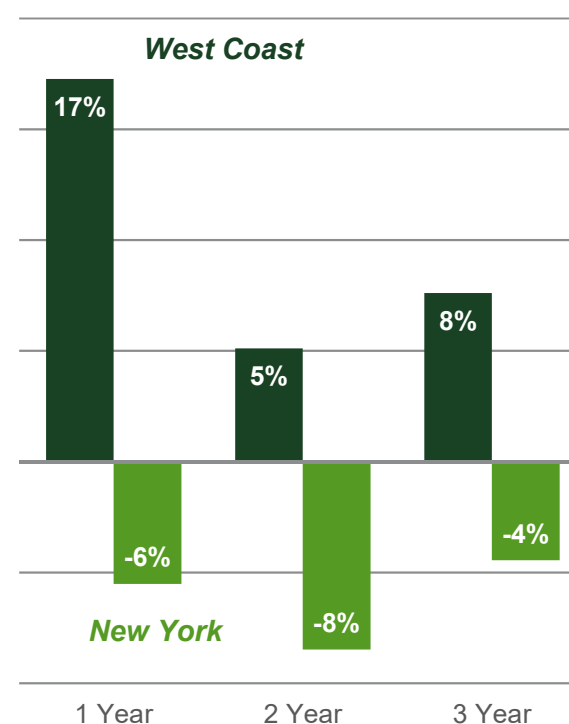
## Overview: REITs March to the Intrinsic NAV Drummer

**A Sucker's Bet:** New York office prices have declined only modestly in recent years, even as the outlook for fundamentals has worsened considerably. As a result, NAVs have held up better than intrinsic NAVs. NAV-centric investors might have been seduced by the very large discounts to NAV that have been in place in the public market, but that would have been a mistake, as NY office REITs have consistently underperformed West Coast peers. NAVs can be inappropriately inflated by investors who overpay for trophies in gateway markets and/or place a high value on liquidity.

**Observed GAV Premium: New York & West Coast Office REITs**



**Total Returns (Annualized)**

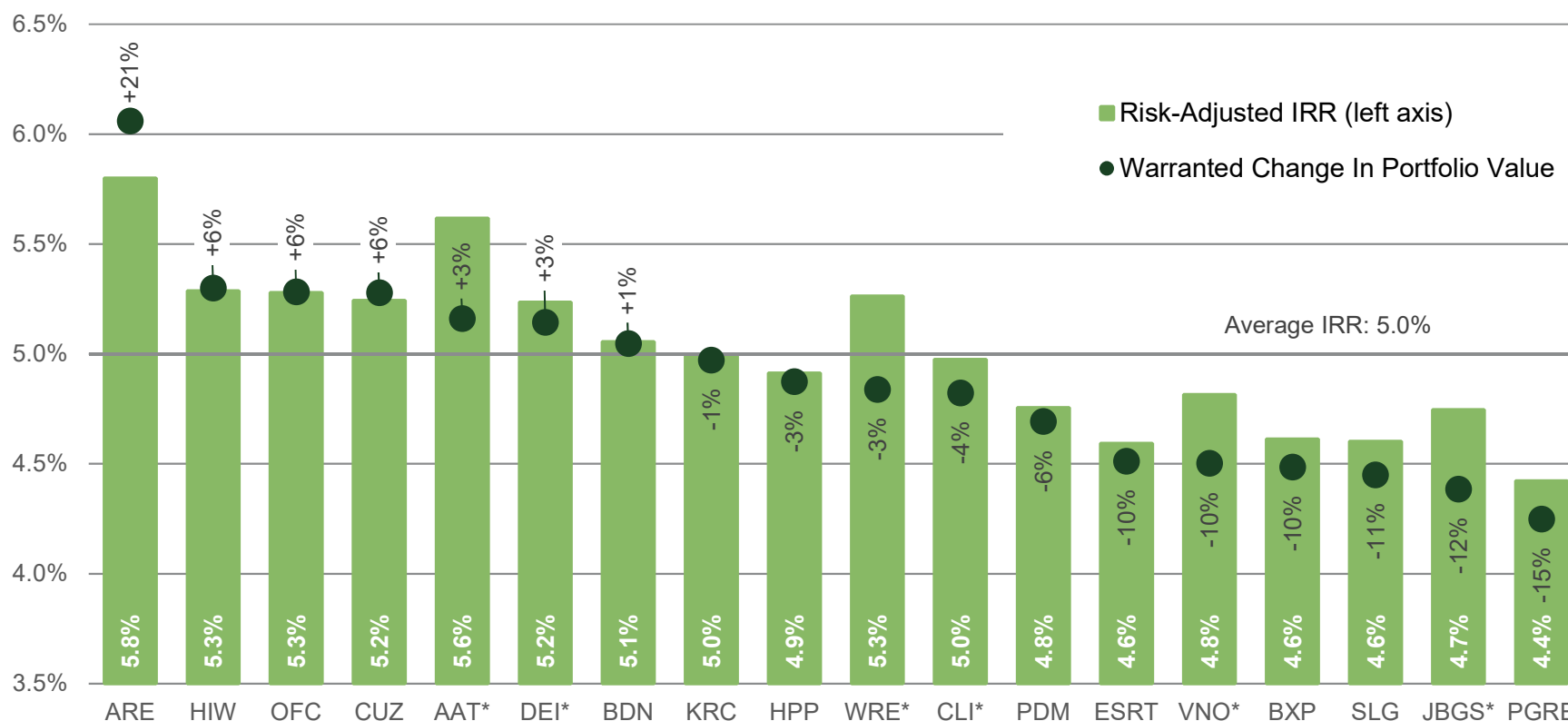


New York is SL Green & Vornado. West Coast is Douglas Emmett & Kilroy.

## The Model: Re-Valuing the Real Estate

**Not All Real Estate is Equal:** In many property sectors, intrinsic NAV & NAV are either identical or very similar, rendering adjustments to market value unnecessary. Office REITs, by contrast, provide a case study for how an IRR analysis can add insight, as large differences in geographic footprints combined with the private market's excessive fondness for gateway trophies, means the underlying properties of some REITs are more attractively priced than others.

### Expected Return of Operating Properties & Relative Fair Value: Office REITs



\* These REITs also own non-office properties that have higher IRRs. In a sector-neutral model, that does not make them cheaper than other office REITs so a discount rate higher than the office average is used. For example, WRE's 50% exposure to apartments makes its discount rate 40 bps higher than it would be otherwise.

## The Model: Intrinsic NAV is the New Starting Point

**A Different NAV, A Different Answer:** Plugging in how much the real estate is worth can result in large differences to NAV and one's view of the premium/discount at which a REIT trades (GAV premium is gross asset value, the unlevered cousin to NAV premium). Some discounts evaporate under the intrinsic value lens, while others widen. NAV is still an important metric and Green Street will ensure its estimates remain the gold standard.

Company	Symbol	Price	NAV	GAV Premium	Warr. Change in Property Value	Intrinsic NAV	Intrinsic NAV vs. NAV	Intrinsic GAV Premium
Empire State Realty	ESRT	13.76	20.14	-25%	-10%	17.63	-12%	-17%
Vornado Realty Trust	VNO	62.19	98.40	-24%	-10%	83.45	-15%	-16%
Brandywine Realty Trust	BDN	14.42	19.40	-15%	+1%	19.71	+2%	-16%
Hudson Pacific Prop	HPP	33.13	44.75	-18%	-3%	43.09	-4%	-16%
Corporate Office Properties	OFC	28.97	33.30	-8%	+6%	36.20	+9%	-13%
Paramount Group	PGRE	12.79	21.90	-26%	-15%	16.64	-24%	-13%
Highwoods Properties	HIW	43.16	48.59	-7%	+6%	52.92	+9%	-13%
Kilroy Realty Corp	KRC	77.70	92.25	-12%	-1%	91.55	-1%	-11%
Cousins Properties	CUZ	36.41	39.35	-5%	+6%	42.44	+8%	-10%
Alexandria Real Estate Equities	ARE	153.87	135.65	9%	+21%	178.20	+31%	-10%
SL Green Realty	SLG	80.45	129.32	-19%	-11%	101.03	-22%	-9%
Washington REIT	WRE	28.15	33.82	-11%	-3%	32.18	-5%	-8%
Piedmont Office Realty Trust	PDM	20.42	26.00	-14%	-6%	23.52	-10%	-8%
Mack-Cali Realty Corp	CLI	21.67	29.08	-11%	-4%	26.70	-8%	-8%
Douglas Emmett	DEI	42.02	42.91	-1%	+3%	44.67	+4%	-4%
JBG Smith	JBGS	38.83	47.72	-14%	-12%	40.14	-16%	-2%
Boston Properties	BXP	127.57	152.52	-11%	-10%	129.55	-15%	-1%
American Assets Trust	AAT	47.06	44.59	4%	+3%	46.59	+4%	1%
Office REIT Average				-12%	-2%			-10%

REITs that own non-office properties and rounding causes average warranted change in property value to not exactly equal zero.

## The Model: Franchise Value

**A Less Exact Science:** Some managers have track records of creating value for shareholders (often through effective allocation of capital), while others have destroyed it. Past behavior, as measured by MVA scores\*, is a good starting point, but scoring franchise ultimately comes down to answering, "How much value do I expect this management team to add over the next 5-10 years?" Scoring is relative to sector peers and excludes the current condition of a company's balance sheet, an item so important and quantifiable that it is dealt with separately.

### Franchise Score (20 pt scale) & Warranted Asset Value Premium: Office REITs

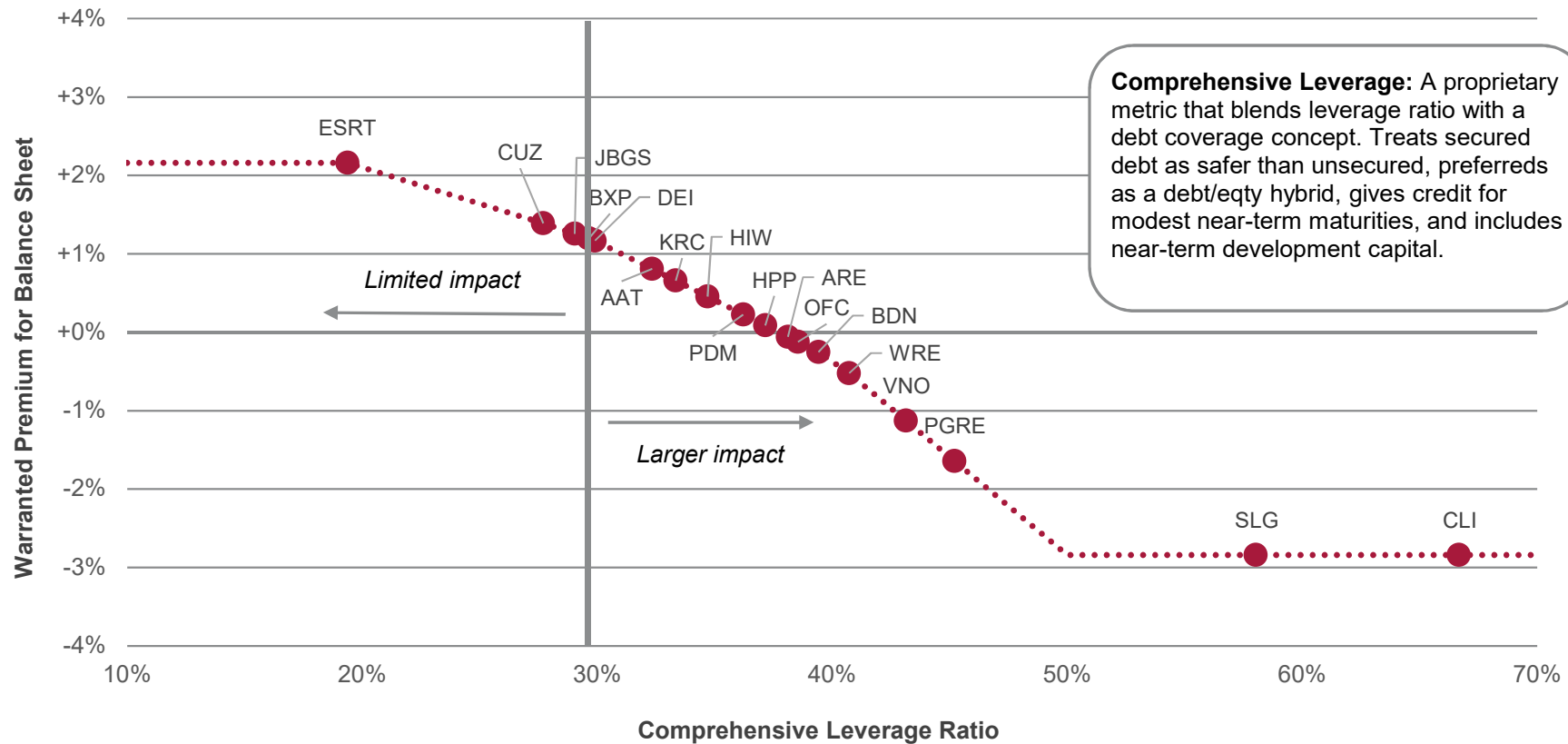


\* MVA is discussed in Management Value Added, Sep 14, 2017. It measures the extent to which NAV growth has outpaced the levered appreciation of the property portfolio.

# The Model: Balance-Sheet Risk

**Costs of Financial Distress:** Merton Miller and Franco Modigliani won Nobel prizes for, among other things, teaching that leverage in excess of the optimal level has an adverse impact on enterprise value. That's because the present value of potential "costs of financial distress" are reflected in value long before distress occurs. REIT history shows that the optimal leverage ratio for most REITs is no higher than 30%, so REITs with higher leverage should – and do – experience discounted share pricing.

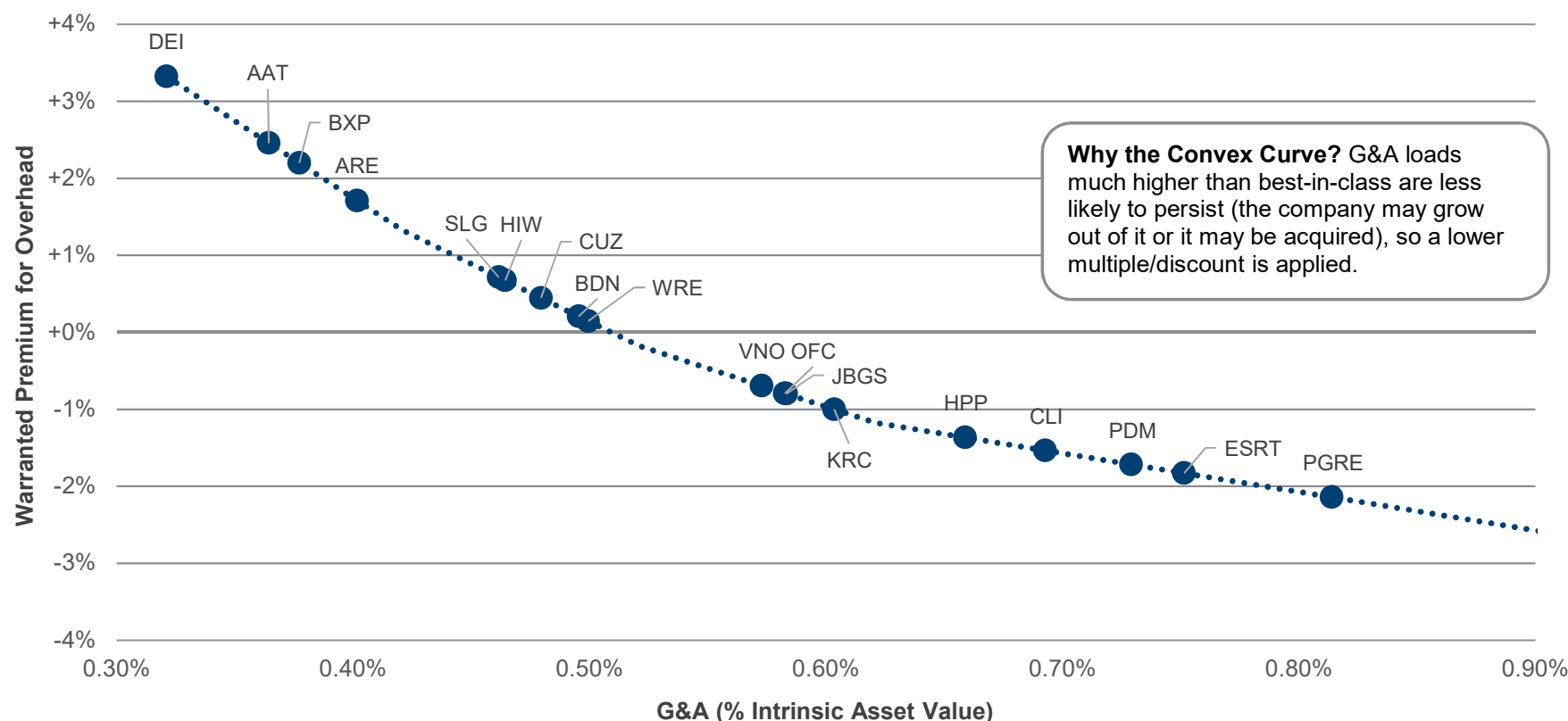
## Comprehensive Leverage Ratio & Warranted Asset Value Premium: Office REITs



## The Model: Overhead (G&A) Expenses

**Don't Forget Overhead:** Some REITs are run much more efficiently than others, yet these differences do not show up in the calculation of Intrinsic NAV. It's usually safe to assume that the differences will persist for years to come, so below/above-average overhead should be capitalized and the ensuing value should be deducted/added when translating intrinsic NAV into a warranted share price. The model employs a multiple for excess G&A ranging from 20X for the first increments (i.e., the most durable) to 5X for amounts well in excess of normal (less likely to persist).

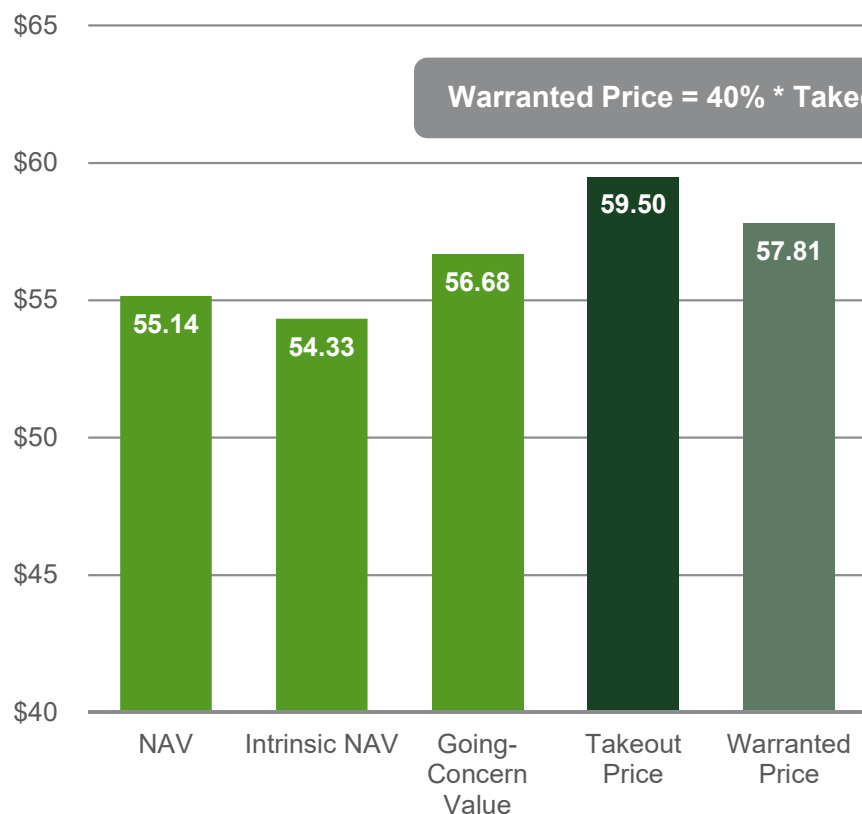
### G&A Load & Warranted Asset Value Premium: Office REITs



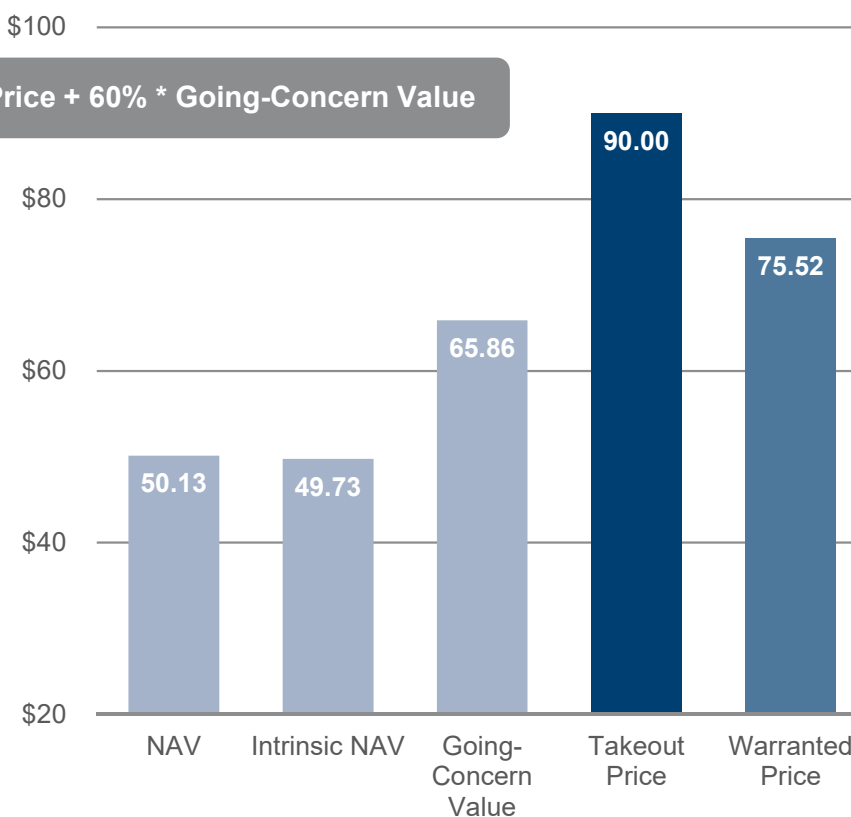
## The Model: Corporate Event Probabilities & Prices

**What About M&A?** The value of a REIT is a function of its real estate, management team, balance sheet, and overhead ratio, but possible corporate events like activism, liquidation, or M&A can also influence value. Takeout prices depend on what a reasonable buyer might pay. In some instances NAV is a good estimate; other times it's not. Liberty Property Trust currently serves as an example of the former, as takeout pricing is likely to be in the same zip code as NAV, whereas a fair acquisition price of CyrusOne would greatly exceed NAV. Takeout odds for both REITs are 40%.

**Industrial REIT – Liberty Property Trust (LPT)**



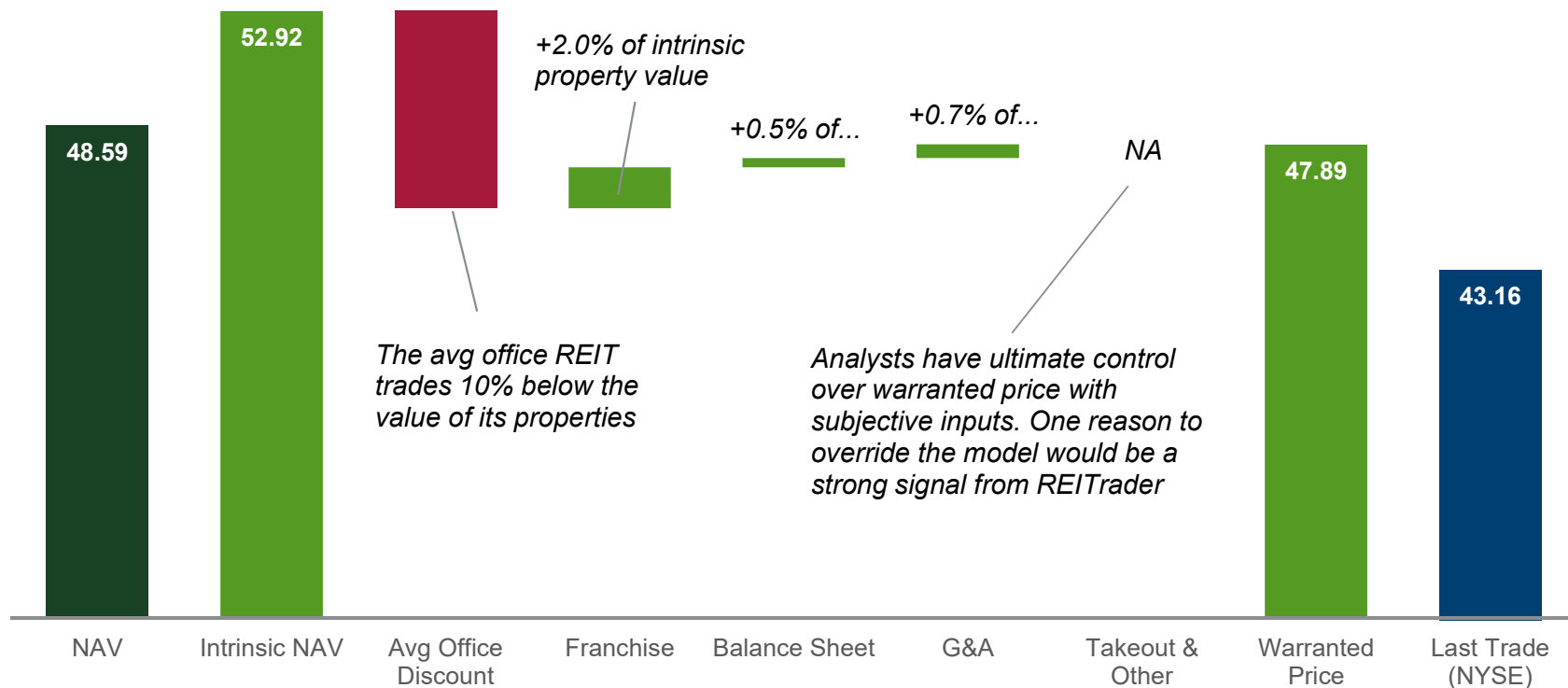
**Data Center REIT – CyrusOne (CONE)**



## The Model: Warranted Price, Step by Step

**Adding It All Together:** The warranted share price of any REIT is a function of the intrinsic value of the real estate, the average premium/discount at which REITs in the sector trade, franchise/mgm't, balance sheet position, G&A ratio, corporate event odds/prices, and other adjustments, such as a strong signal from REITrader (a tool that identifies unusual stock price behavior). Sunbelt office REIT Highwoods Properties owns properties that offer attractive risk-adjusted returns relative to other office REITs. The company also scores above average on all other metrics and screens as attractively priced in the new model.

### Build-up to Warranted Price: Office REIT Highwoods Properties (HIW)

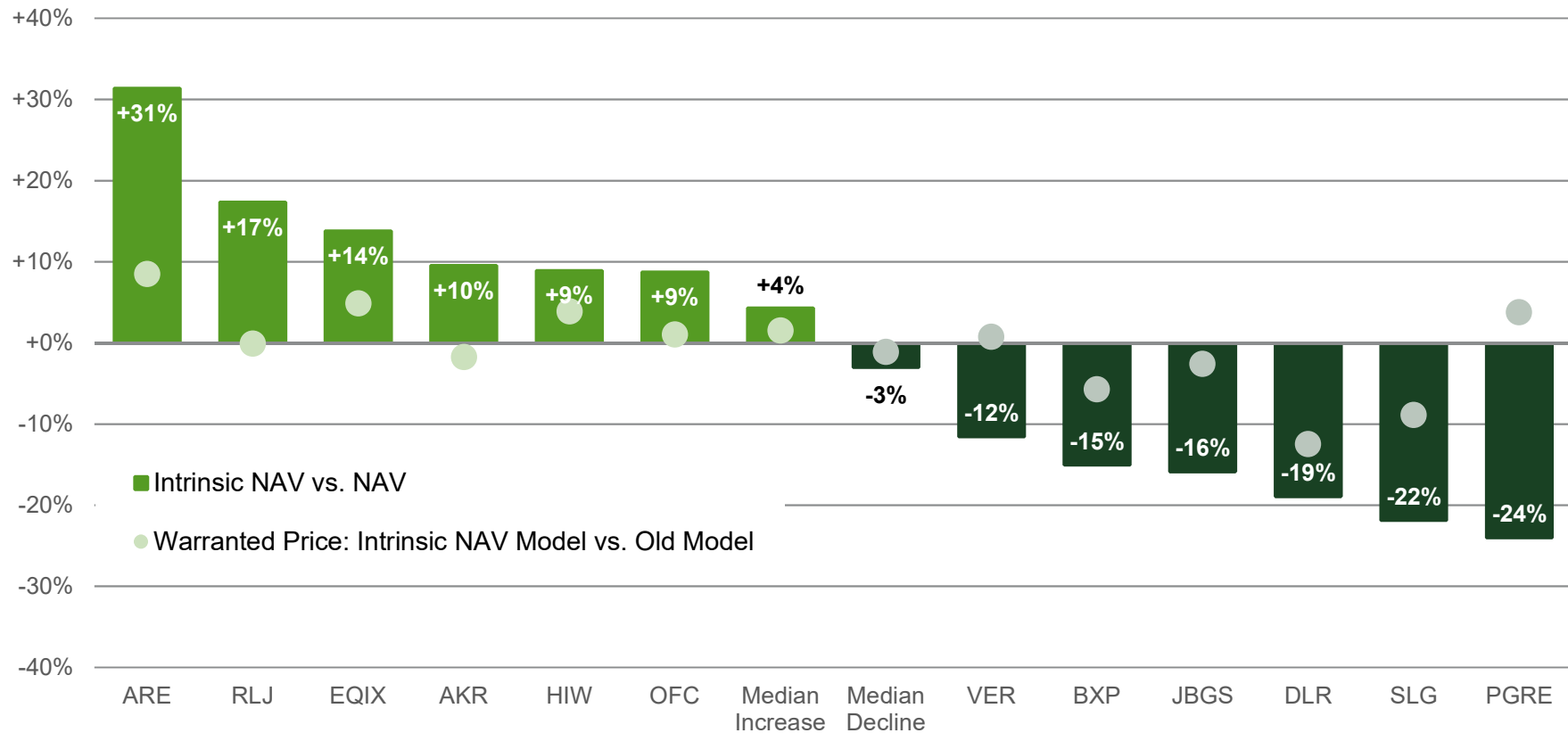




# What's Changed

**Notable Winners & Losers:** The switch of focus to intrinsic NAV obviously benefits REITs where intrinsic NAV is substantially higher than NAV, and vice versa. The office sector is well represented on this list, as non-gateway names benefited from the change, while REITs with large exposures to eastern gateway markets witnessed a reduction in warranted price. In most instances, changes in warranted price are smaller than the gap between intrinsic NAV and NAV, as analysts have been keeping an eye on this model for quite some time.

## Largest Differences Between Intrinsic NAV & NAV and Corresponding Changes to Warranted Share Price



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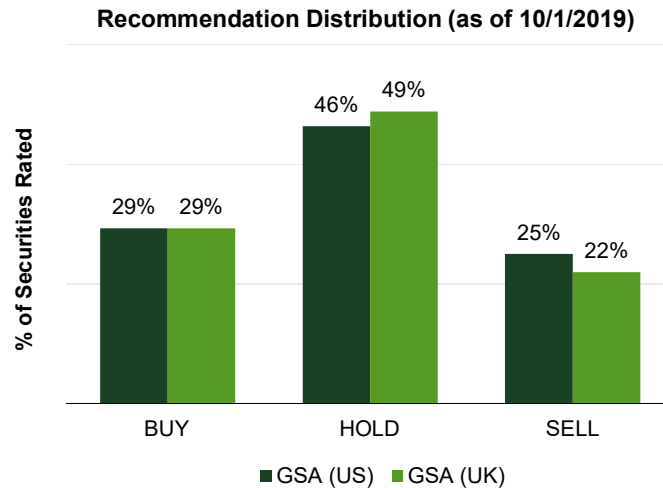
## Review of Recommendations:

- Unless otherwise indicated, Green Street reviews all investment recommendations on at least a monthly basis.
- The research recommendation contained in this report was first released for distribution on the date identified on the cover of this report.
- Green Street will furnish upon request available investment information supporting the recommendation(s) contained in this report.

# Green Street Advisors Disclosure Statement

At any given time, Green Street publishes roughly the same number of "BUY" recommendations that it does "SELL" recommendations.

Green Street's "BUYs" have historically achieved far higher total returns than its "HOLDs", which, in turn, have outperformed its "SELLs".



**Total Return of Green Street's Recommendations<sup>1,2</sup>**

Year <sup>3</sup>	Buy	Hold	Sell	Universe
2019 YTD	28.9%	21.8%	20.8%	23.7%
2018	-5.1%	-6.6%	-9.2%	-7.0%
2017	6.4%	0.2%	2.1%	2.6%
2016	14.9%	14.7%	13.1%	14.4%
2015	8.3%	0.9%	-1.7%	2.4%
2014	41.6%	31.5%	27.3%	33.3%
2013	4.1%	0.6%	1.7%	2.2%
2012	24.5%	24.7%	18.9%	23.0%
2011	18.9%	7.6%	-4.7%	7.6%
2010	43.3%	32.8%	26.6%	33.8%
2009	59.0%	47.7%	6.0%	37.9%
2008	-28.1%	-30.9%	-52.6%	-37.3%
2007	-6.9%	-22.4%	-27.8%	-19.7%
2006	45.8%	29.6%	19.5%	31.6%
2005	26.3%	18.5%	-1.8%	15.9%
2004	42.8%	28.7%	16.4%	29.4%
2003	43.3%	37.4%	21.8%	34.8%
2002	17.3%	2.8%	2.6%	5.4%
2001	34.9%	19.1%	13.0%	21.1%
2000	53.4%	28.9%	5.9%	29.6%
1999	12.3%	-9.0%	-20.5%	-6.9%
1998	-1.6%	-15.1%	-15.5%	-12.1%
1997	36.7%	14.8%	7.2%	18.3%
1996	47.6%	30.7%	18.9%	32.1%
1995	22.9%	13.9%	0.5%	13.5%
1994	20.8%	-0.8%	-8.7%	3.1%
1993	27.3%	4.7%	8.1%	12.1%
<b>Cumulative Total Return</b>	<b>20701.9%</b>	<b>1347.4%</b>	<b>45.6%</b>	<b>1614.2%</b>
<b>Annualized</b>	<b>22.2%</b>	<b>10.5%</b>	<b>1.4%</b>	<b>11.2%</b>

The results shown above are hypothetical; they do not represent the actual trading of securities. Actual performance will vary from the hypothetical performance shown above due to, but not limited to 1) advisory fees and other expenses that one would pay; 2) transaction costs; 3) the inability to execute trades at the last published price (the hypothetical returns assume execution at the last closing price); 4) the inability to maintain an equally-weighted portfolio in size (the returns above assume an equal weighting); and 5) market and economic factors will almost certainly cause one to invest differently than projected by the model that simulated the above returns. All returns include the reinvestment of dividends. Past performance, particularly hypothetical performance, cannot be used to predict future performance. Investing involves risk and possible loss of principal capital.

- Results are for recommendations made by Green Street's North American Research Team only (includes securities in the US, Canada, and Australia). Since July 5, 2017, performance is calculated whenever a recommendation is changed using the share price at the most recent market close. Previously, performance was based on recommendations provided in Green Street's "Real Estate Securities Monthly" (RESM) and assumed no change in recommendation between RESM publications. Results from January 28, 1993 through January 4, 2016 were independently verified by an international "Big 4" accounting firm. The accounting firm did not verify the stated results subsequent to January 4, 2016. As of January 4, 2016, the annualized total return of Green Street's recommendations since January 28, 1993 was: Buy +24.0%, Hold +11.1%, Sell +0.6%, Universe +11.7%.
- Beginning July 5, 2017, all companies in Green Street's North American coverage universe are included in the performance calculation. Previously, inclusion in the calculation of total return had been based on whether the companies were listed in the primary exhibit of Green Street's "Real Estate Securities Monthly" and had a rating other than "Not Rated".
- From 1993 until July 3, 2017, the returns for each year cover the period following the first RESM issued in the respective year through the first RESM issued in the following year and are not based on a calendar year. Subsequent to July 5, 2017, returns are based on calendar months.

Per NASD rule 2711, "Buy" = Most attractively valued stocks. We recommend overweight position; "Hold" = Fairly valued stocks. recommend market-weighting; "Sell" = Least attractively valued stocks. We recommend underweight position.

Green Street will furnish upon request available investment information regarding the recommendation

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