Presale:

CyrusOne Data Centers Issuer I LLC (Series 2023-1)

April 17, 2023

*(**Editor's Note:** Since assigning our preliminary ratings to this transaction on April 17, 2023, the payment priority has changed to include a subordinated notes sweep amount for the class B notes before releasing remaining cash flows to equity. The changes are reflected in the article titled "New Issue: CyrusOne Data Centers Issuer I LLC (Series 2023-1)," published May 3, 2023.)*

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Preliminary Rating

Class	Preliminary rating(i)	Preliminary amount (mil. $)	Maximum LTV ratio (%)(ii)	Anticipated maturity (years)	Legal maturity (years)
A-2	A- (sf)	596	70	5	25
B	BBB- (sf)	105	N/A	5	25

Note: This presale report is based on information as of April 17, 2023. The rating shown is preliminary. Subsequent information may result in the assignment of a final rating that differs from the preliminary rating. Accordingly, the preliminary rating should not be construed as evidence of a final rating. This report does not constitute a recommendation to buy, hold, or sell securities. (i)The preliminary ratings do not address post-anticipated repayment date additional interest. (ii)The maximum allowable class A LTV ratio, per the transaction documentation. LTV--Loan-to-value.

Profile

Expected closing date	April 26, 2023.
Collateral	Primarily the asset entities' real property interests in the data centers; the personal property and fixtures located on the data centers; tenant leases; reserves and escrows; certain transaction accounts; and the equity interest in each of the asset entities.
Issuer	CyrusOne Data Centers Issuer I LLC.
Manager	CyrusOne L.P.
Servicer	KeyBank N.A.
Indenture trustee	Citibank N.A.
Arrangers	Barclays Capital Inc., KKR Capital Markets LLC, Citigroup Global Markets Inc., Goldman Sachs & Co. LLC, and Wells Fargo Securities LLC.

Advance Notice Of Proposed Criteria Change: Data Center Securitizations

S&P Global Ratings announced on Jan. 18, 2023, that it is reviewing its approach for analyzing securitizations backed by data centers and that it aims to develop and publish specific criteria for this type of securitization. The ratings S&P Global Ratings assigns to the notes could change as a result of that review, depending on the final criteria adopted and our assessment of the transaction. We cannot provide an estimated completion date for our criteria review at this time (see "Advance Notice Of Proposed Criteria Change: Data Center Securitizations," published Jan. 18, 2023).

Transaction Overview

CyrusOne Data Centers Issuer I LLC's (CyrusOne's) series 2023-1 note issuance is a securitization of real estate and tenant lease payments for space and electrical capacity in CyrusOne L.P.'s (the manager) five completed and operating data centers located in Sterling, Va., and San Antonio, Texas, with an aggregate appraised value of $960 million. The series 2023-1 notes are the first issuance for the master trust, and the collateral will be shared between series 2023-1 and any future series. CyrusOne will use the proceeds to repay the existing mortgage debts related to the data centers, acquire all of the equity interests in the asset entities, and pay transaction expenses.

The aggregate critical load power available at the data centers is 65.25 megawatts (MW). Approximately 58.3% of total leased capacity comes from the Sterling facilities, and the remaining 41.7% is contributed by the San Antonio facilities. Currently, two data centers in Sterling and one data center in San Antonio are multi-tenant, while the other two buildings, one in Sterling and one in San Antonio, are single-tenant.

All of the data centers in this portfolio are turnkey, in which CyrusOne owns the critical mechanical and electrical infrastructure and provides space, physical security, power, and cooling as well as ongoing maintenance of the power and cooling systems. Additionally, modified gross leases are expected to comprise 100% of the annualized adjusted base rent (AABR) generated by the transaction's portfolio as of the closing date. However, this proportion could change over time as capacity is released to future tenants.

Rationale

The preliminary ratings assigned to CyrusOne's data center revenue notes series 2023-1 reflect

- Our view of the lease portfolio's projected performance,
- The real estate value,
- The experience of the manager and servicer,
- The manager- and indenture trustee-provided advances,
- The estimated closing date debt service coverage ratio (DSCR) of 1.63x,
- The initial liquidity reserve deposit of approximately $8.2 million covering the higher of three months of note interest and 12 months of priority expenses and targeted maintenance capital expenditures, and
- The transaction's structure.

We rated the notes under our "Principles of Credit Ratings," published Feb. 16, 2011, with certain stress assumptions borrowed from our triple-net ABS criteria "Methodology And Assumptions For Rating North American Single-Tenant Real Estate Triple-Net Lease-Backed Securitizations," published March 31, 2016. Wholesale data center leases are not in the scope of our triple-net ABS criteria due to the properties' multitenant nature and the fact that wholesale data center leases are not all triple-net, among other factors. As described in the S&P Global Ratings' Stress Scenario Assumptions section, we amended several of our typical triple-net lease assumptions to consider the limited historical performance of the wholesale data center sector and the manager, the multitenant nature of the data centers, and the possibility for average tenant credit quality to drift downward over the transaction's life.

Environmental, Social, And Governance (ESG) Credit Factors

Our rating analysis considered the potential exposure of the transaction to ESG credit factors. In our view, the exposure to ESG credit factors in this transaction is in line with other transactions in the sector. Data center securitizations typically consist of a pool of data center properties and related leases with tenants.

Data centers are more exposed to environmental risks than other property types because physical climate risk could impact not only the building structure but also access to power. This risk is exacerbated in pools with relatively high concentration by geography and number of properties. Nonetheless, the properties are designed to be resilient to prolonged power outages, and the geographic diversity of the collateral pool may partially mitigate these environmental risks. CyrusOne's collateral pool consists of five data centers located in two states in the U.S., slightly more concentrated than other rated data center securitizations. To mitigate risks from extreme weather events (such as flood or earthquake), fire, and casualty events, or incidents of terrorism, tenants generally have insurance policies to mitigate the risk of natural disasters and damage-causing events.

Social credit factors are neutral for this sector because data centers are not labor-intensive and are also typically not subject to health and safety risks. Social trends toward working from home, online shopping, and increased digitization of workstreams all stand to support the growth and stability of data centers.

Governance credit factors for data center ABS are neutral. We considered CyrusOne's strategy, risk management, and internal controls within our operational risk assessment framework. Given that collateral pools are typically static, the roles and responsibilities of each transaction party and the allocation of cashflows are well-defined, and transactions are structured to achieve the isolation of the assets from the seller. However, governance weaknesses at the property manager levels could still have a negative rating effect.

In addition, the issuer expects that the notes will constitute green bonds, based on the generally accepted market principles for classification of securities as "green bonds" published by the International Capital Markets Association (ICMA). At the time of issuance, the net proceeds will be allocated to acquire equity interests in asset entities owning energy efficiency projects, which are defined as data centers with power usage effectiveness of 1.5 or below (eligible projects). The issuer has appointed a second-party opinion provider to evaluate the alignment of the portfolio of eligible projects to the ICMA's Green Bond Principles. However, the issuer does not make any representation in the transaction document regarding the allocation or ongoing compliance with the relevant industry standards (i.e., the 2021 Green Bond Principles).

Transaction Strengths

We consider certain factors to be the transaction's strengths:

- The portfolio composition: The portfolio is 100% composed of turnkey data center facilities, where the manager owns the critical mechanical and electrical infrastructure. The facilities are unlike typical real estate assets as they feature robust physical security, diverse fiber connectivity, and redundant power and cooling systems. They are developed in multiple phases over several years, and the development costs for a data center are exponentially higher than other real estate assets.

- The strong management team: CyrusOne has over 20 years of operating history, and its management team is comprised of individuals with extensive experience in real estate, REITs, telecommunications, technology, and mission-critical infrastructure industries.
- The markets in which the data centers are located: Three of the properties (55.0% by AABR) are located in Northern Virginia, the largest data center market in the world. The remaining two properties (45.0% by AABR) are located in San Antonio, where CyrusOne has the largest market share among data center operators (as of 2021, according to 451 Research).
- The underlying tenants' initial credit quality: 70.3% of tenants are investment-grade (rated 'BBB-' and above) by AABR.
- The staggered lease maturities: The expiration dates of leases within the portfolio range from 2023 to 2034. Approximately 45% and 19% of the total AABR correspond to leases with options to extend for two additional terms of five years each and three additional terms of five years each, respectively.
- Low customer churn rates, supported in part by the high cost of tenant relocation: Based on historical vacancy data provided by the company, four out of five facilities have experienced 0.0% churn rate since inception.
- In-place lease rates that are competitive with local market rates: Current per-kW-per-month rents at the San Antonio data centers are higher than the average rent for hyperscale leases concluded by the appraiser. Current per-kW-per-month rents at the Northern Virginia data centers are generally within the market range provided by the appraiser.
- The lack of an early termination option for convenience: The majority of the existing leases do not have early termination options for convenience or may exercise the options by paying termination fees and/or finding replacement tenants.
- The experienced servicer, KeyBank N.A.: S&P Global Ratings has assigned KeyBank the rating of "Strong" as a master servicer, primary servicer, and special servicer.
- The class A loan-to-value (LTV) ratio: The LTV ratio is constrained at 70% of the assets' appraised value.
- The transaction's structural features: Performance triggers include scheduled amortization, cash trapping, or early amortization if the DSCR or leased capacity drop below certain minimum thresholds.

Transaction Weaknesses

The transaction's strengths may be offset by certain weaknesses:

- A shorter weighted average remaining term: The 5.2-year weighted average remaining term (weighted by AABR) is shorter than some of the other data center transactions that we have rated.
- Closing date DSCR: The transaction's estimated closing date DSCR of 1.63x is at the lower end of data center transactions we have rated.

- The limited tenant diversity: Approximately 41.7% of leased capacity and 45.3% of total AABR is attributable to a single tenant, and 86.2% of total AABR is attributable to the top five tenants.
- The limited geographic diversity: Three data centers are located in Sterling (contributing 55.0% of total AABR), and two data centers are located in San Antonio (comprising 45.0% of total AABR).
- The liquidity reserves: The reserves could prove insufficient if a disruptive event, such as a natural disaster, rendered any of the data center campuses inoperable for an extended period.
- The limited restrictions on the terms of future eligible leases, such as tenant credit quality, contract length, and optional termination features: The terms could cause the overall credit risk profile of the lease portfolio to erode over time.
- The potential for decreased data center demand: Upon lease expiration, tenants with reduced needs could choose to migrate to the public cloud or other retail colocation data centers, while tenants with increased needs could opt to build, own, and operate their own data centers.
- The limited industry diversity: Most tenants are in various subsectors of the technology industry.
- The relatively short historical sector performance data: Approximately 13 years of performance data are available for the wholesale data center segment.
- The supply and demand conditions within the data centers' local markets: Supply and demand could change adversely over time, driving down lease rates or driving up vacancy rates.
- The high current demand for data center operations personnel: It can become expensive to replace current key members of the manager's leadership team, including the chief operating officer and senior engineering team members.
- The potential for early lease termination: The occurrence of a change of control from CyrusOne to certain key tenants' direct competitors could lead to the early termination of some leases.

Mitigants To Transaction Weaknesses

We believe certain factors partly mitigate the transaction's weaknesses:

- The portfolio's weighted average original lease term of 8.8 years, which is comparable to that of other data center transactions we have rated.
- The scheduled amortization amount of 3% per annum of the initial outstanding principal balance of the series 2023-1 class A-2 notes if prior to April 2027, the three-month DSCR falls below 1.55x (most of the recent data center transactions we have rated have no scheduled amortization).
- The underlying tenants' initial credit quality, with the largest tenant rated 'AAA' comprising 45.3% of total AABR.
- The high costs for tenants to move to alternative data centers, including time, redundancy (to avoid service interruption), and logistical expenses (moving or duplication of network gear, racks, servers, and related fit-out).
- The requirement that the issuer maintain comprehensive liability, fire, earthquake, extended coverage, business interruption, and rental loss insurance policies, which we expect to be compliant with the minimum requirements of our insurance criteria for U.S. CMBS transactions.

- The decreased wholesale data center demand due to the migration of the manager's smaller tenants to the public cloud or retail colocation may be offset by increased demand from the manager's larger tenants, some of which are themselves retail colocation and public cloud providers.
- Interest expenses, priority operating expenses, and maintenance capital expense advancing by the manager, with a backup obligation by the indenture trustee.
- The stress scenarios performed in our cash flow analysis, which considered the pool's industry concentration, the limited industry history, and the potential for downward migration in average tenant credit quality.
- The timely interest and ultimate principal payments paid on the notes by the legal final maturity under our stress scenarios.
- The change of control could lead to an event of default and rapid amortization of the notes. In addition, the probability of an acquisition by the direct competitors of the key tenants is relatively low, in our view, due to the potential erosion on the data centers' property value if the specified tenant leases were to terminate prior to their contractual expiration.

Industry Characteristics: Data Center Sector

Data centers are real estate facilities that house computer servers and network equipment within a highly secure environment with redundant mechanical, cooling, and electrical power systems and network connections. The data center operator, such as CyrusOne, is responsible for maintaining the facility's infrastructure, providing physical security, and re-leasing the sites' capacity as it becomes vacant.

Wholesale data centers place the entire responsibility for managing the tenant's network and equipment on the tenant, whereas retail colocation facilities, which tend to support tenants with shorter-term and smaller capacity needs, may offer varying levels of hands-on support and other services. In either the wholesale or retail data center model, the proper provision of uninterruptable power and cooling is critical to avoid any disruption in the tenant's business operations, especially those whose services necessitate consistent connection to their network through these data centers.

Data center leases are structured in various ways, including triple-net and modified gross leases. Triple-net leases require tenants to reimburse the site manager for costs, including taxes, insurance, operating expenses, and electricity. Modified gross leases, on the other hand, only require the tenants to reimburse the manager for their electricity expense. Under both types of leases, tenants are responsible for all costs related to the provision, installation, and upkeep of their equipment and network connectivity.

We believe the exponential increase in data usage, broad migration to the cloud, and transition to a fully digitized economy will continue to shape demand for third-party-operated data centers. Overall supply and demand is relatively balanced as new data center development has been constrained in certain markets by site availability, lingering supply chain issues, and, more recently, power capacity constraints.

Although we expect data centers to see some growth deceleration in a recessionary environment, we believe it will be mitigated by the critical nature of data centers. Against the high inflation backdrop, elevated raw material costs along with the rising cost of capital and possible material shortages could slow the pace of expansion and medium-term revenue growth rates of data center operators.

We also believe the long-term industry risks include shifting technology, cloud service providers in-sourcing their data center needs, tenant concentration, and weaker pricing trends in hyperscale segments. Nonetheless, market data suggest that 2022 vacancy rates were low for key data center markets and rental rates increased year over year.

Market summary

Northern Virginia is home to the largest data center market in the world in terms of operational square feet and megawatts (MW), and approximately 70.0% of the world's internet traffic runs through this area. This region has the highest density of dark fiber in the world, providing low latency to the internet backbone. As of 2022, 451 Research estimates that Northern Virginia has over 12 million square feet and more than 2,000 MW of capacity. The market continues to grow due to its relatively low power rates, affordable land, data center-specific tax incentives, general safety from natural disasters, and proximity to a primary internet exchange connectivity point on the East Coast.

More than half of data center development in the U.S. is concentrated in Northern Virginia. In July 2022, Dominion Energy informed developers that it wouldn't be able to provide expected power to some new data center developments and that the delayed delivery of power may last until 2026. The power delays are expected to increase rents and benefit operators with customer leases expiring over the next two years.

San Antonio is considered a secondary data center market. According to 451 Research, the San Antonio data center market is composed of approximately 380,000 square feet and 60 MW of multi-tenant space, with a compound annual growth rate of approximately 9% from 2014 through 2021. Demand primarily comes from cloud users, while other large portions of tenant share come from healthcare, financial and insurance, and oil and gas energy companies.

San Antonio benefits from Texas's affordable electric rates, state-wide tax incentives, and about 10% to 15% lower overall costs of operation than other data center markets. Data from 451 Research in 2021 indicated that CyrusOne is the market share leader in San Antonio with an estimated 80% of the built-out net operational space.

Business Description: CyrusOne

CyrusOne, founded in 2001 and headquartered in Dallas, is an owner, operator, and developer of carrier-neutral multi- and single-tenant data center properties and currently operate 55 data centers in North America and Europe. CyrusOne currently provides services to nearly 800 tenants operating in multiple industries, including information technology; financial services; energy, oil, and gas; mining, medical, research, and consulting services; and goods and services. In the fourth quarter of 2021, CyrusOne leased about 101 MW of capacity in 530,000 sq. ft. of operational space, representing approximately $8.7 million in monthly recurring rent. As of year-end 2022, CyrusOne had about 748 MW in service.

The initial public offering of CyrusOne occurred on Jan. 24, 2013, and traded on the NASDAQ Exchange under the ticker symbol CONE. On March 25, 2022, funds managed by Kohlberg Kravis Roberts & Co. and Global Infrastructure Partners took the company private and acquired 100% of the outstanding common equity of CyrusOne for approximately $15 billion.

S&P Global Ratings met virtually with the CyrusOne management team on Jan. 20, 2023, and visited the three Northern Virginia data centers on Feb. 1, 2023.

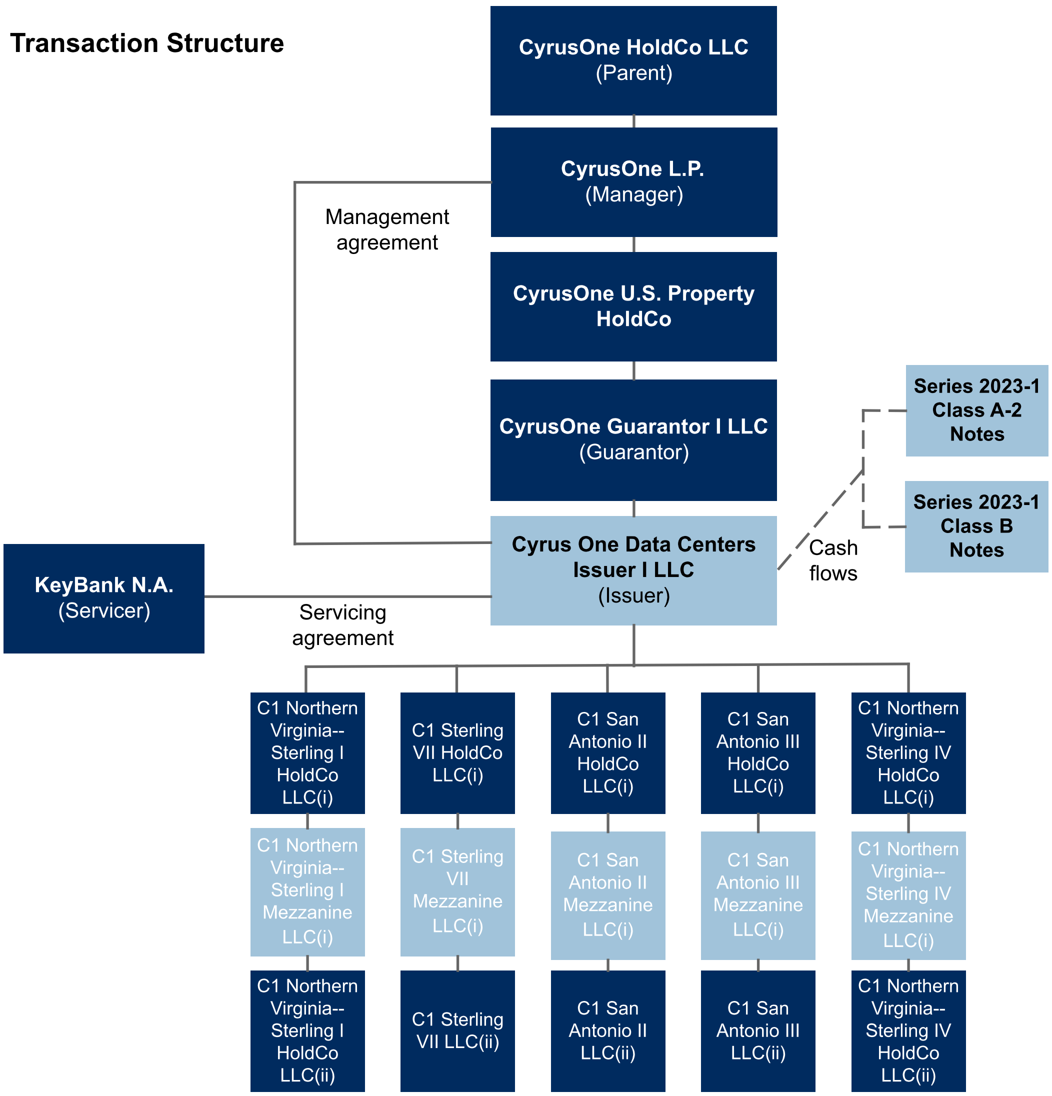
Transaction Structure

Chart 1 shows an overview of the transaction's structure. The issuer is a bankruptcy-remote Delaware limited-liability company formed solely to hold the equity interests and to issue notes. The issuer will be a direct, wholly owned subsidiary of CyrusOne Guarantor I LLC, the guarantor, and an indirect wholly owned subsidiary of CyrusOne Holdco LLC, the parent. The issuer will grant a security interest in all of the equity interest in each closing date asset entity to the indenture trustee on behalf of the noteholders as collateral security for the notes.

Each closing date asset entity will be a direct or indirect wholly-owned subsidiary of the issuer. Each closing date owner asset entity is a special purpose entity (SPE) that owns no assets other than the data centers, tenant leases, and related assets.

Series 2023-1 will be the inaugural issuance for this issuer. The issuer may issue additional series of notes (subject to the satisfaction of certain conditions, including DSCR and LTV ratio tests) that are secured by the entire collateral pool. Future series issuance will share collateral within this master trust.

Chart 1



(i)Closing date holdco asset entity. (ii)Closing date owner asset entity. Both closing date holdco asset entities and closing date owner asset entities are referred to as closing date asset entities. Holdco--Holding company.

Pool And Structural Characteristics

CyrusOne Data Centers Issuer I LLC's data center revenue notes series 2023-1 is a securitization of fee-simple ownership interests in five completed and operating data centers, two located in San Antonio and three in Northern Virginia. The data centers represent a total of 725,625 gross sq. ft. of space and 65.25 MW of capacity available to tenants to operate their servers and computing equipment.

Table 1 provides a comparison table on the pool of data centers and their respective leases.

Table 1

Pool characteristics

	CyrusOne 2023-1	Vantage 2023-1	Stack 2023-1	Aligned 2022-1	Sabey 2022-1/2	Compass 2022-1
Appraised value of data centers (mil. $)	960	3,718	2,621	2,626	2,002	1,131
No. of data centers	5	13	8	5	6	13
No. of tenants	57	18 (not including enterprise tenants)	26	32	92	5
S&P Global Ratings' value (mil. $)(i)	491	1,883	1,327	1,279	833	452
S&P Global Ratings' weighted average cap rate (%)(ii)	8.62	8.83	8.70	8.69	8.75	9.06
CLP leased (kW)	64,746	174,422	138,305	161,466	76,082	43,525
Capacity ramped (kw)	64,746	163,071	118,680	130,308	69,430	34,911
Total potential CLP (kw)	65,250	176,100	143,980	162,000	81,849	43,525
Annualized adjusted base rent (mil. $)	77.7	272.9	187.6	174.0	120.9	55.1
Turnkey (%)(ii)	100.0	100.0	93.8	100.0	78.0	100.0
Powered shell (%)(ii)	0.0	0.0	6.2	0.0	22.0	0.0
Triple-net leases (%)(ii)	0.0	0.0	45.0	0.0	19.0	32.8
Modified gross leases (%)(ii)	100.0	100.0(iii)	55.0	100.0	81.0	67.2
Weighted average original lease term (years)(ii)	8.8(iv)	11.8	10.9	7.0	12.1	10.0
Weighted average remaining lease (years)(ii)	5.2(iv)	7.7	6.6	5.0	6.3	5.6
Range of original lease (mos.)	18-162	36-240	36-183	36-144	36-294	53-182
Range of remaining lease (mos.)	1-141	2-163	12-145	1-120	1-155	3-168
Closing date DSCR	1.63	2.47	2.44	2.47	2.07	2.22
% of investment-grade tenants(ii)	70.3	89.2	71.0	62.2	69.3	67.2

Table 1

Pool characteristics (cont.)

	CyrusOne 2023-1	Vantage 2023-1	Stack 2023-1	Aligned 2022-1	Sabey 2022-1/2	Compass 2022-1
Largest five tenants (% of AABR)	86.2	83.3	74.8	74.3	49.6	100.0
Largest five tenants(ii)	Tenant 1 (45.3%), tenant 2 (19.2%), tenant 3 (11.3%), tenant 4 (5.6%), and tenant 5 (4.8%)	Tenant 1 (57.3%), tenant 2 (12.4%), tenant 3 (4.8%), tenant 4 (4.7%), and tenant 5 (4.0%)	Tenant 1 (35.4%), tenant 2 (20.0%), tenant 3 (8.2%), tenant 4 (6.2%), and tenant 5 (5.0%)	Tenant 1 (26.4%), tenant 2 (19.3%), tenant 3 (11.3%), tenant 4 (10.5%), and tenant 5 (6.9%)	Tenant 1 (15.9%), tenant 2 (12.7%), tenant 3 (9.0%), tenant 4 (6.0%), and tenant 5 (6.0%)	Tenant 1 (54.2%), tenant 2 (22.1%), tenant 3 (6.7%), tenant 4 (4.0%), and tenant 5 (12.9%)
Largest three business sectors(ii)	Information technology - cloud (77.4%), information technology - enterprise/managed services (10.1%), and other (6.7%)	Cloud (60.6%), tech hardware (16.4%), and software (6.3%)	Big data (46.4%), media (20.0%), and telecommunications (12.7%)	Cloud (40.7%), tech (34.8%), and financial services (12.7%)	Technology (71.0%), health care (14.4%), and media (3.3%)	Hyperscaler (67.2%), colocation datacenter (28.8%), and enterprises (4.0%)
State concentrations(ii)	Virginia (55.0%) and Texas (45.0%)	California (71.5%), Washington (11.8%), and Quebec (16.7%)	California (28.2%), Illinois (20.1%), Texas (18.1%), Oregon (17.9%), Virginia (9.8%), Georgia (5.2%), and Ohio (0.8%)	Arizona (43.3%), Utah (25.1%), Virginia (24.2%), and Texas (7.5%)	Washington (80.8%), Virginia (11.0%), and New York (8.2%)	Quebec (54.2%), Ontario (12.9%), Texas (8.0%), Tennessee (7.3%), North Carolina (7.2%), Minnesota (6.7%), and Oklahoma (3.6%)

(i)Represents the liquidation value estimated in accordance with "CMBS Global Property Evaluation Methodology," published Sept. 5, 2012. (ii)By annualized adjusted base rent. (iii)Including 2.0% enterprise leases. (iv)Excluding 4.0% enterprise leases. Aligned--Aligned Data Centers Issuer LLC. Sabey- Sabey Data Center Issuer LLC. Compass--Compass Datacenters Issuer LLC. Stack--Stack Infrastructure Issuer LLC. Vantage--Vantage Data Centers Issuer LLC. CyrusOne--CyrusOne Data Centers Issuer I LLC. CLP--Critical load power. DSCR--Debt service coverage ratio. kW--Kilowatt.

Charts 2-6 provide additional details about the underlying portfolio as of the statistical cutoff date.

Chart 2

Portfolio distribution by tenant

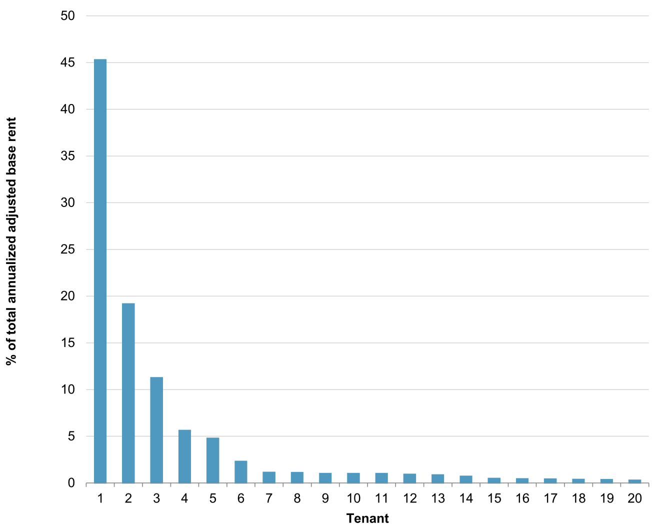


Chart 3

Tenant credit ratings
(% of total annualized adjusted base rent)

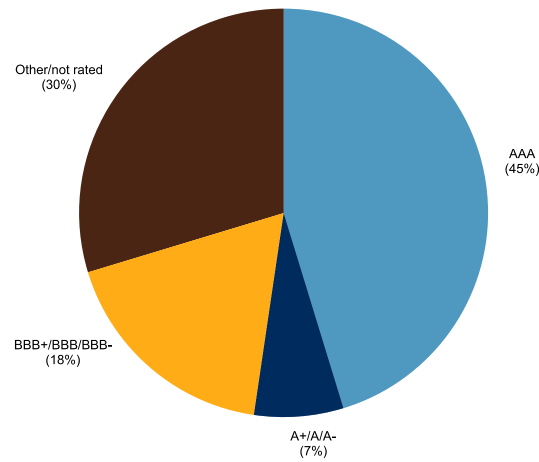
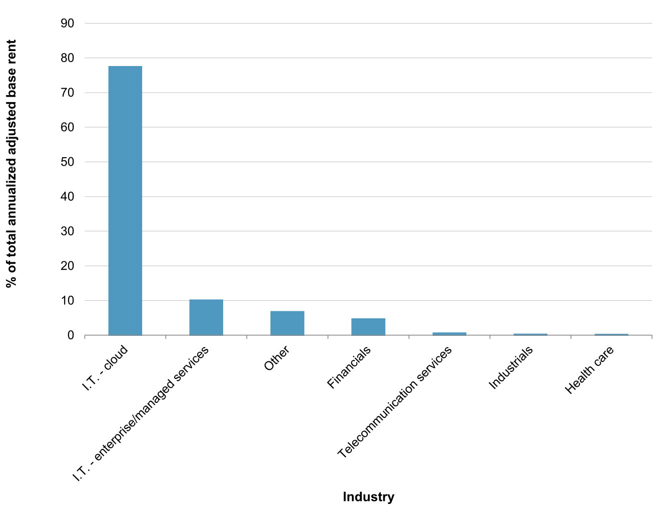


Chart 4

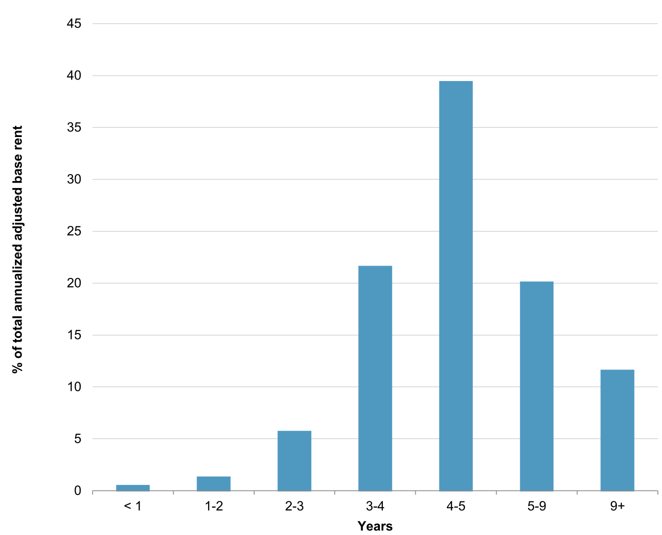
Portfolio distribution by industry



I.T.--Information technology.

Chart 5

Portfolio distribution by remaining term



Manager Operating Duties

The manager will have certain operating duties specified in the management agreement. These duties include:

- Marketing the data center space to new tenants;

- Negotiating and executing new tenant leases and renewals;
- Administering tenant leases, including invoicing rent and other receipts, and managing delinquencies and defaults;
- Maintaining insurance, including property, casualty, and business interruption insurance;
- Paying real and personal property taxes;
- Keeping the data centers in compliance with applicable laws and regulations;
- Providing for necessary maintenance and arranging for utilities (including electricity), services, equipment, and supplies;
- Providing physical security to the data centers, including guards, fingerprint monitors, fencing, and other mechanisms that provide for the physical safety of tenants' infrastructure;
- Managing capital improvements and other construction in connection with the leasing of site space; and
- Making debt service advances and property protection advances.

The issuer will pay the manager a monthly management fee equal to 3% of the aggregate base rent (not including the operating and maintenance capital expenses) as compensation for those duties.

Manager Performance Obligation

Because all arrangements in the portfolio are turnkey, the tenant leases include service-level agreements (SLAs) that require the manager to provide uninterrupted levels of electricity, access, and cooling to the tenant. In support of that requirement, the manager maintains, as part of the data center infrastructure, backup batteries and generators that provide uninterrupted power in the event of temporary electric utility outages.

Most SLAs provide remedies for the prolonged or repeated interruption of critical services. These remedies are generally limited to the reimbursement of a portion of already paid rent in proportion to the duration of the outage (although, in practice, no cash flows would be paid back to the tenant and would merely be netted against future rent obligations). Based on our assessment of the manager's operational procedures, the experienced management team, and the negligible number of SLA breaches during its operating experience, we believe SLA breaches represent a minimal risk to the cash flows.

Transaction Expenses

Transaction expenses, other than the management fee, fall into the three categories summarized in the table 2.

Table 2

Expenses

Expense category	Payment priority	Expenses covered	Monthly budgeted expense amount(i)
Priority expenses	First payment in the application of funds	Taxes, insurance premiums, electricity (subsequently charged to the tenants), and, if applicable for future series, rents payable relating to any data center, including any ground rents(i).	Included in budgeted operating expenses.
Operating expenses	Seventh payment in the application of funds (following the payment of note interest)	Site labor operations, repairs and preventative maintenance, utilities (excluding electricity), and security.	Inclusive of priority expenses, the greater of $8.5 million, which is subject to an annual 2% escalator, and 27% of data center revenue.
Maintenance capital expenses	Seventh payment in the application of funds (following the payment of note interest)	Maintenance and replacement of batteries; capacitors (uninterruptable power supply), electrical switches, and generators; chiller plants; cooling towers, motors, and compressors; and other infrastructure components.	$3.50 per kW of critical load power of completed data center, subject to an annual 2% escalator.

(i)The issuer has fee simple ownership over all real estate. kW--Kilowatt.

Based on the manager's expense estimates, the expense estimates provided by the independent real estate appraiser in conjunction with the data center appraisals, and the comparable values we have seen in CMBS transactions, we believe the expenses budgeted for in the payment priority are adequate. Furthermore, in the Sensitivity Analysis section, we assessed the break-even increase in operating and maintenance capital expenses (beyond the 2% annual escalation currently budgeted for in the transaction documentation) that the transaction can withstand while still paying timely interest and ultimate principal.

Payment Priority

On each distribution date, the available funds will be used to pay expenses, interest and principal in the priority shown in table 3. There is no variable-funding note in the series 2023-1 issuance.

Table 3

Waterfall

Priority	Payment
1	Priority expense reserve.
2	Prior payment dates' unpaid indenture trustee, servicing, and other servicing fees; then, unreimbursed indenture trustee advances and interest; then, current payment date's indenture trustee, servicing, and other servicing fees; and then unreimbursed manager advances and interest.
3	Additional issuer expenses to the indenture trustee, servicer, and/or other applicable person so as not to exceed the annual additional issuer expense limit; and then the VFN agent fee (if applicable).
4	Accrued note interest for all notes, accrued and unpaid commitment fees, and other fees, expenses, and other amounts due to the VFN notes (if applicable), including LOC fees.
5	Monthly expense amount to the obligors in excess of amounts drawn from the liquidity reserve for operating and maintenance capital expenditures or liquidity LOC; and then any pass-through data center operating expenses.
6	Unpaid management fee to the manager.

Table 3

Waterfall (cont.)

Priority	Payment
7	Operating expenses and maintenance capital expenditures for current calendar month in excess of amounts drawn from the liquidity reserve account or liquidity LOC, not including servicer-approved monthly expense amounts.
8	Required liquidity reserve amount.
9	If an amortization period is not then in effect and no event of default has occurred and is continuing, an amount equal to any class A LTV test sweep amount as of the application date.
10	If an amortization period is not then in effect and no event of default has occurred and is continuing, an amount equal to the scheduled amortization amount and to the extent not previously paid for all prior payment dates.
11	If an amortization period is not then in effect, a cash trap condition is not then in effect, and no event of default has occurred and is continuing, an amount equal to the class A-2 monthly amortization amount for any class A-2 notes of a series for the relevant payment date.
12	If an amortization period is not then in effect and no event of default has occurred and is continuing, the additional principal payment amount together with any applicable prepayment consideration.
13	If, after the ARD for any series of outstanding VFN or term notes, an amortization period is not in effect and no event of default has occurred and is continuing, the aggregate unpaid principal balance of such outstanding VFN notes or term notes.
14	If a cash trap condition is continuing and no event of default has occurred and is continuing, the remaining amount of available funds to the cash trap reserve account; then, if an amortization period is not in effect, to the debt service account, an amount equal to the class A-2 monthly amortization amount for any class A-2 notes of a series for the relevant payment date.
15	During an amortization period or continuation of an event of default, the principal balance of all outstanding notes.
16	To the debt service account until the amount on deposit is equal to the amount of contingent interest, deferred contingent interest, post-ARD additional interest, and deferred post-ARD additional interest due to the notes for the relevant payment date.
17	Additional issuer expenses not paid in item 3 due to the annual additional issuer expense limit plus accrued interest to the indenture trustee, servicer, and/or other applicable person.
18	Operating expenses and maintenance capital expenditures of the asset entities not paid related to items 5 and 7 with amounts drawn from the liquidity reserve account.
19	To the executed forward starting lease reserve account and/or qualified new lease reserve account at the manager's direction.
20	Optional payments on the principal to the class A-1 noteholders at the direction of the issuer.
21	Manager-determined amounts to the capital expenditures reserve account.
22	Unreimbursed discretionary advances, including advance interest, to the manager.
23	The remaining available funds to the issuer to be used for any purpose not prohibited under the transaction documents.

VFN--Variable-funding note. LOC--Letter of credit. LTV--Loan-to-value. ARD--Anticipated repayment date.

In the payment priority, the class A notes interest is senior to the class B notes interest, and the class A notes principal is senior to the class B notes principal.

Liquidity reserve account

The transaction features a liquidity reserve account of approximately $8.2 million at closing, funded by the issuance proceeds. The liquidity reserve is sized to cover the greater of three months of note interest or 12 months of priority expenses and targeted maintenance capital expenses.

Performance triggers

A scheduled amortization period will occur as of the end of any calendar month until April 2027 if the three-month average DSCR is less than 1.55x, and it will continue until it is above 1.55x as of the last day of such calendar month. During a scheduled amortization period, 0.25% per month of the initial outstanding principal balance of the series 2023-1 class A-2 notes will be applied to pay the aggregate unpaid principal amount of the class A-2 notes. If the available amount is insufficient to cover all scheduled amortization amount due, any unpaid portion will be paid in the subsequent periods.

A cash trap condition will occur if the three-month average DSCR is less than 1.35x, and it will continue until it is above 1.35x as of the last day of two consecutive months. During a cash trap condition, all excess cash will be diverted to the cash trap reserve. All funds in the cash trap reserve will be deposited into the available amount if a cash trap condition is ongoing for nine consecutive months or an amortization period commences.

An amortization period will occur if the three-month average DSCR is less than 1.20x, and it will continue until it is above 1.20x as of the last day of two consecutive months. An amortization period will also commence and remain in effect if the net capacity reduction percentage remains greater than 10% as of the last month and previous eight months, and it will continue until the three-month average DSCR is above 1.20x as of the last day of two consecutive months, provided that if the three-month average DSCR is not less than 1.20x as of the last day of any of the nine consecutive months prior to capacity reduction date, no amortization period will have commenced. During an amortization period, all excess cash flow will be applied to the aggregate unpaid principal amount of the notes sequentially across class A then class B.

The DSCR is calculated as the ratio of the excess of annualized adjusted net operating income over the annualized targeted maintenance capital expenditure to mandatory debt service, where mandatory debt service consists of interest on the class A and B notes to be paid over the succeeding 12 payment dates and the amount of indenture trustee fees and servicing fees due during such period.

The net capacity reduction percentage is calculated as the sum of the aggregate amount of reduction in leased capacity and the aggregate amount of leased capacity allocated to defaulted tenants divided by the greater of the aggregate amount of leased capacity as of the most recent issue date and the aggregate amount of leased capacity as of the last day of any calendar month.

Debt service advance

The manager must make interest advances on the notes if the funds are deemed recoverable. The advances are meant to cover any shortfalls resulting from timing mismatches because of missed lease payments and any interest shortfalls. This requirement excludes make-whole amounts, post-ARD additional interest, deferred post-ARD additional interest, and principal and reserves held by or on behalf of the indenture trustee. If the manager fails to make an advance, the indenture trustee must make the debt service advance in its place. These requirements for advances serve as a form of liquidity for the notes; however, we do not rely on advances in our cash flow projection.

S&P Global Ratings' Stress Scenario Assumptions

To determine the appropriate preliminary ratings for the series 2023-1 notes, we analyzed the transaction's cash flows utilizing stress assumptions derived in part from our criteria for rating single-tenant real estate triple-net lease-backed securitizations. We ran various cash flow scenarios to test the transaction's sensitivity to changes in default timing, given the transaction's credit enhancement (see "Methodology And Assumptions For Rating North American Single-Tenant Real Estate Triple-Net Lease-Backed Securitizations," published March 31, 2016).

In our opinion, the risk to the cash flow generated from the portfolio of data centers and their associated leases can be attributed to certain major factors:

- Defaults of the initial pool of tenants (the lessees),
- The property manager's ability to fill the vacant space at a comparable lease rate upon a lessee default or lease expiration,
- The lease terms for new tenants (rental rate and lease term),
- The credit profile of new tenants, and
- The liquidation value of the data centers toward the legal final maturity of the transaction.

We made certain primary modifications to our triple-net lease criteria to address the differences between triple-net leases and wholesale data center leases as well as the data centers' relative lack of performance history:

- We did not assume any lease acceptance in the bankruptcy proceedings for defaulted tenants, given the lack of historical observations of defaulted wholesale data center tenants.
- We did not assume property liquidations until the 12-month window before the transaction's legal final maturity as we typically would for triple-net leases because the data centers are multi-tenant occupied. We believe it would likely be more economical for the manager to continue operating the centers rather than liquidate them, even during periods of high vacancy rates.
- For tenants not rated by S&P Global Ratings, we assumed a 'CCC-' rating rather than the typical 'B' rating specified in the triple-net lease criteria. This assumption reflects the lack of performance data for the wholesale data sector.
- Given the limited eligibility requirements for future tenants' credit quality, we assumed that by the start of our second default wave the tenant pool will have migrated from its current average credit quality of 'B+' down to an average credit quality of 'CCC-'.
- Given the limited history of wholesale data lease rates and the uncertainty around future supply and demand conditions, we applied re-lease haircuts for both performing and defaulted leases that are consistent with those that are one full rating category above the haircut rates specified in the triple-net lease criteria. For example, at the 'A' category, we would assume a 20% loss in rental income upon lease renewal for a performing lease rather than the 15% specified in the criteria. Similarly, at the 'A' category, we would assume a 35% haircut to re-lease rental rates post-default for defaulted leases rather than the 30% specified in the criteria.

We applied two waves of default and used S&P Global Ratings' CDO Evaluator to determine the initial collateral pool's scenario default rate, with certain assumptions:

- For the first default wave, the initial lessee's issuer credit rating from S&P Global Ratings or 'CCC-' for unrated lessees;
- For the second default wave, 'CCC-' for the entire portfolio;
- The allocated collateral value per lease, calculated as each lease's total remaining scheduled payments;
- The current remaining terms of the leases; and
- The higher of portfolio default rate and the largest obligor default rate.

We determined the portfolio's property liquidation value using our commercial real estate methodology (see "CMBS Global Property Evaluation Methodology," published Sept. 5, 2012). We assumed rental income based on the in-place leases, the appraiser's estimate of market rent, and recent leasing data from the market and then applied a vacancy deduction to the potential gross income. We estimated expenses and expense reimbursements based on information from the appraisal reports and comparable properties. These expenses included fixed items (such as real estate tax and insurance), estimated management fees, and variable expenses, which were reimbursed in our income projections. We determined net cash flow after deducting estimated leasing commissions, tenant improvement expenses, and capital reserves and expenditures based on projected lease roll assumptions. We selected direct capitalization rates based on factors such as appraisal and market capitalization rates, property performance and tenant strengths, and property location.

Table 4 shows a summary of stress assumptions.

Table 4

Cash Flow Assumptions

Stress level	A-	BBB-
Standard scenario default rate		
Portfolio scenario default rate (default wave 1) (%)(i)	53.8	33.7
Portfolio scenario default rate (default wave 2) (%)(i)	96.9	93.7
Largest-obligor test		
Portfolio scenario default rate (default wave 1) (%)(i)	53.1	49.3
Portfolio scenario default rate (default wave 2) (%)(i)	95.8	93.2
Non-defaulting leases		
Lease rate credit upon renewal (%)	81.7	86.7
Defaulting leases		
Accepted in bankruptcy (%)	0.0	0.0
Rejected in bankruptcy and re-leased (%)	100.0	100.0
Re-lease lag (months)	12	12
Lease rate credit (%)	66.7	71.7
Liquidation proceeds ($)	491,242,739	491,242,739

(i) We select the higher of the standard default rate and the largest-obligor test for each wave

Cash Flow Analysis

To determine whether the available credit support is sufficient to withstand the assumed losses, we examined various simulated cash flow scenarios. In each scenario, the cumulative effects of the assumptions we detailed above were applied with four default timing curves in two default cycles (curves 1-4; see table 5) where the first default wave starts in year 1, the second default waves starts in year 11, and final liquidation starts one year before series 2023-1 notes' legal final maturity date. The second default wave was applied sooner than we would typically apply it for other data center transactions because CyrusOne's portfolio has a shorter weighted average remaining lease term of 5.2 years at issuance (not considering renewal options), compared with the average six- to nine-year remaining lease terms we have seen in other data center lease portfolios. However, the portfolio's weighted average original lease term of 8.8 years is similar to other data center portfolios' original lease term.

Table 5

Default Curves

Year	Curve 1 (%)	Curve 2 (%)	Curve 3 (%)	Curve 4 (%)	Curve 5 (%)(i)
1	40	10	10	15	40
2	10	10	10	15	30
3	10	10	10	15	20
4	10	40	10	15	10
5	10	10	10	15	0
6	10	10	10	15	0
7	10	10	40	10	0

(i)Sensitivity run 4.

In each rating scenario (curves 1-4), the notes pay timely interest and full principal by their rated final maturity, and there were no deferred expenses (priority, operating, or maintenance capital expenses). Although the transaction documents require the manager or indenture trustee to make advances on interest payments (if deemed recoverable), no advances were assumed in the cash flow modeling scenarios.

Sensitivity Analysis

Assuming a base-case scenario in which we assumed contractual cash flows with no losses and one renewal at the same lease rate following the initial lease term, we ran several break-even cash flow runs (sensitivity runs 1 through 3) to measure the transaction's ability to withstand decreases in revenue or increases in expenses.

Sensitivity run 1: gross revenue reduction stress

We found that the class A and B notes could withstand a 28% and 25%, respectively, reduction in monthly gross revenue and still pay timely interest and full principal by the rated final maturity.

Sensitivity run 2: maintenance capital expense stress

We found that the class A and B notes could withstand a 8.4x and 7.6x, respectively, increase in monthly budgeted maintenance capital expenses and still pay timely interest and full principal by the rated final maturity.

Sensitivity run 3: priority expense, operating expense, and maintenance capital expense stress

We found that the class A and B notes could withstand an 11% annual escalation of priority expenses, operating expenses, and maintenance capital expenses (instead of the 2% assumed in the rating scenario) and still pay timely interest and full principal by the rated final maturity.

Sensitivity run 4: Curve 5 default pattern

To address the renewal risk and potential tenant credit migration due to the transaction's shorter remaining term, we ran a more stressful front-loaded default timing curve (curve 5 in table 5) as a sensitivity analysis, with the second default wave commencing in year 8 and liquidation in year 15. We found that neither class A notes nor class B notes pass this scenario at their respective stress levels.

Events Of Default

Under the transaction documents, each of the following constitutes an event of default, subject to applicable cure conditions:

- A failure to pay timely interest on class A and B notes.
- A failure to pay principal on any notes by legal final maturity.
- A failure to pay any other amount, to the extent that on the payment date there are funds available in the transaction accounts.
- A failure to comply with financial reporting requirement.
- A failure to comply with the covenants in the indenture or transaction documents, which failure is likely to cause a material adverse effect.
- A breach of representations and warranties that is likely to cause a material adverse effect.
- The obligor or guarantor being subject to involuntary bankruptcy proceedings.
- The obligor or guarantor initiating voluntary bankruptcy proceedings.
- A change of control resulting in the specified tenant's lease termination.
- The guarantor ceasing to own 100% of the issuer, or the issuer ceasing to own 100% of any asset entity.
- A division of the obligor or guarantor into two or more limited liability companies under the Delaware code.

Legal Matters

We expect the issuers' SPE provisions to be consistent with our bankruptcy-remoteness criteria. In rating this transaction, we will review the legal matters that we believe are relevant to our analysis, as outlined in our criteria.

Surveillance

We will maintain active surveillance on the rated notes until the notes mature or are retired. The purpose of surveillance is to assess whether the notes are performing within the initial parameters and assumptions applied to each rating category. The transaction terms require the issuer to supply periodic reports and notices to S&P Global Ratings for maintaining continuous surveillance on the rated notes.

Related Criteria

- Criteria | Structured Finance | ABS: Advance Notice Of Proposed Criteria Change: Data Center Securitizations, Jan. 18, 2023
- General Criteria: Environmental, Social, And Governance Principles In Credit Ratings, Oct. 10, 2021
- Criteria | Structured Finance | General: Global Framework For Payment Structure And Cash Flow Analysis Of Structured Finance Securities, Dec. 22, 2020
- Criteria | Structured Finance | Legal: U.S. Structured Finance Asset Isolation And Special-Purpose Entity Criteria, May 15, 2019
- Criteria | Structured Finance | General: Counterparty Risk Framework: Methodology And Assumptions, March 8, 2019
- Criteria | Structured Finance | ABS: Methodology And Assumptions For Rating North American Single-Tenant Real Estate Triple-Net Lease-Backed Securitizations, March 31, 2016
- Criteria | Structured Finance | General: Global Framework For Assessing Operational Risk In Structured Finance Transactions, Oct. 9, 2014
- General Criteria: Global Investment Criteria For Temporary Investments In Transaction Accounts, May 31, 2012
- General Criteria: Principles Of Credit Ratings, Feb. 16, 2011

Related Research

- Economic Outlook U.S. Q1 2023: Tipping Toward Recession, Nov 28, 2022
- Credit FAQ: How U.S. Data Centers Are Navigating Inflation And Recession Risks, July 21, 2022
- ESG Credit Indicator Report Card: Real Estate, Dec. 14, 2021
- Field Of Data Streams: If You Build It, They Will Come, Sept. 20, 2019
- Cloud Disruption: Cloud Adoption And Digital Transformation Are Positives For The Data Center Industry, Sept. 7, 2018

- Despite Continued Growth, U.S. Data Centers May Face Long-Term Risks From Financial Pressures And Uncertain Tech Developments, Oct. 30, 2017
- Global Structured Finance Scenario And Sensitivity Analysis 2016: The Effects Of The Top Five Macroeconomic Factors, Dec. 16, 2016
- Credit FAQ: Analyzing The Real Estate Characteristics Of Data Centers, July 25, 2016