Your Loan Through a Credit Scorecard

Sample: a fictional London apartment owner · Standard term loan · Multifamily · $18,000,000 loan · London, Ontario

CHANCE OF DEFAULT (PD)	LOSS IF IT DEFAULTS (LGD)	AMOUNT AT RISK (EAD)	EXPECTED LOSS A YEAR
1.47%	**27.52%**	**$18,958,036**	**$76,808**
Within a year, on the CRE Engine's benchmark	Share of the loan the lender expects to lose	Drawn balance + 48% of undrawn	90% range $20,913 to $167,071

What this means for you

On the CRE Engine's benchmark, the chance that this loan defaults within a year is about 1.47%, which is about the same as a typical standard term loan on multifamily (risk index 43 of 100, where 50 is typical). Expect standard pricing and conditions; the points below are where a lender will push. If it did default, the model expects the lender to lose 28% of what is owed after selling the property and paying costs.

Where you have room, and where you do not

- Income covers the payments 1.39x (amortizing over 25 years): net operating income can fall 14% before the 1.20x coverage covenant is breached.
- The property's value can fall 38% before the amount at risk is no longer covered.
- At maturity the balance of $16,068,875 refinances in full in the base case; in the downside the gap is $464,328.

What a lender will focus on

The drivers that weigh most on the default risk are DSCR / debt service cushion, Market & submarket fundamentals and Leverage (LTV/LTC). The loss if things go wrong depends most on Guarantee / recourse strength and Collateral value volatility. These are the points to answer in your application package, before a credit officer raises them. The section “What you can do” below turns them into actions.

Lender terms, in plain language

- PD (probability of default): the chance the model gives that the loan defaults within a year.
- LGD (loss given default): the share of the loan the lender expects to lose if it does, after selling the property and paying legal and selling costs.
- EAD (exposure at default): what would be owed at that point, including undrawn amounts likely to be drawn first.
- Expected loss = PD x LGD x EAD: what the lender sets aside for risk each year; it drives pricing, covenants and how much it will lend.
- DSCR (debt service coverage): net operating income divided by the year's loan payments. Lenders want room above 1.00x, often 1.20x to 1.25x.
- LTV / LTC: the loan as a share of the property's value, or of the project's cost.
- Debt yield: net operating income divided by the loan; a quick test of how much income stands behind each dollar lent.

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Key findings, in lender terms

- 12-month expected loss is $76,808 (0.41% of exposure at default), from a 1.47% 12-month probability of default, a 27.52% loss given default and $18,958,036 of exposure at default. Over the 5-year term this implies a cumulative default probability of 7.15% and an indicative lifetime expected loss of $372,894.
- At origination: DSCR 1.39x (amortizing over 25 years), debt yield 10.3%, implied cap rate 6.0% and LTV 58%; collateral value could fall 38% before exposure at default is uncovered.
- Largest contributors to the default risk index (43.1 of 100): DSCR / debt service cushion, Market & submarket fundamentals and Leverage (LTV/LTC).
- Loss severity is most sensitive to Guarantee / recourse strength and Collateral value volatility; exposure growth before default to Likelihood of further draws pre-default and Covenant / monitoring strength.
- Uncertainty: given the evidence credited to the scorecards, there is a 90% probability that 12-month expected loss lies between $20,913 and $167,071, and that the 12-month PD lies between 0.48% and 2.90%.
- Expert judgment on an industry benchmark gives a prior 12-month PD of 1.36%. Updating it with the lender's own experience (3 defaults in 200 loan-years) gives a posterior of 1.47%.
- Repayment and exit (standard term loan): On Downside NOI with takeout rates 150 bps and cap rates 75 bps higher, the refinance gap is $464,328 (coverage 0.97x).
- Cashflow stress: Downside scenario falls below the 1.20x DSCR covenant floor in year 4.
- Physical risk: a 1-in-20-year damaging rainfall or flood event (a 22% chance over the term) would take DSCR to 0.97x in year 2, breaching the covenant, and raise LGD from 27.52% to 32.30% if it preceded a default.

Project setup

Loan structure	Standard term loan	**Property type**	Multifamily
Deal stage	Stabilized	**Market**	London, Ontario
Loan amount (drawn)	$18,000,000	**Undrawn commitment**	$2,000,000
LTV / LTC	58%	**Collateral value**	$30,800,000
Interest rate	5.50%	**Loan term**	5 years
NOI (current / stabilized)	$1,850,000	**Covenant DSCR floor**	1.20x
Sponsor experience	12 years		

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The lender’s tests

The measures a lender checks at origination, with typical market ranges. The ranges are general conventions, not any lender’s policy.

Metric	Value	Basis	Indicative lender context
Loan-to-value (input)	58%	As entered	Commonly up to 65%-75% for stabilized income property
Loan-to-value (implied)	58.4%	Drawn loan / collateral value	Should agree with the input LTV
DSCR at origination	1.39x	NOI / debt service (amortizing over 25 years)	Commonly at least 1.20x-1.25x
Debt yield	10.28%	NOI / drawn loan	Commonly at least 8%-10%
Implied cap rate	6.01%	NOI / collateral value	Should be in line with market cap rates for the asset
Collateral cushion	38.4%	1 - EAD / collateral value	Value decline absorbable before exposure is uncovered

Input consistency checks passed

LTV agrees with loan and collateral value, and the driver ratings agree with the deal's own numbers.

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Risk scorecards: how the model reached its numbers

In short: each driver of risk is rated against a typical comparable loan, and the ratings move an industry benchmark up or down. Technically: each scorecard turns an expert-weighted assessment of the deal's risk drivers into a risk index (0-100). The index scales the industry benchmark symmetrically, from 0.5x for the lowest-risk profile through 1.0x for a neutral profile to 2.0x for the highest, to form an expert-informed prior. The prior, given a strength in equivalent observations, is then updated with the lender's own observed experience through a conjugate Beta-Binomial update: posterior = (prior strength x prior + observations x observed rate) / (prior strength + observations). The benchmark enters once, through the prior; with no observed data the posterior equals the prior.

12-month Probability of Default (PD)

Risk index 43.1 of 100. Largest contributors: DSCR / debt service cushion, Market & submarket fundamentals and Leverage (LTV/LTC).

EXPERT-INFORMED PRIOR	OBSERVED EXPERIENCE	POSTERIOR PD
1.36%	1.50%	1.47%
Benchmark scaled by the rated drivers	3 defaults in 200 loan-years	90% CI 0.48% to 2.90%

Loss Given Default (LGD)

Risk index 38.9 of 100. Largest contributors: Guarantee / recourse strength and Collateral value volatility.

EXPERT-INFORMED PRIOR	OBSERVED EXPERIENCE	POSTERIOR LGD
25.72%	32.00%	27.52%
Benchmark scaled by the rated drivers	8 defaulted loans at 32%	90% CI 14.83% to 42.05%

Exposure at Default (draw-down factor) (EAD)

Risk index 42.5 of 100. Largest contributors: Likelihood of further draws pre-default and Covenant / monitoring strength.

EXPERT-INFORMED PRIOR	OBSERVED EXPERIENCE	POSTERIOR EAD
45.06%	55.00%	47.90%
Benchmark scaled by the rated drivers	8 defaulted facilities at 55%	90% CI 32.70% to 63.28%

Expected loss

12-month expected loss = PD x LGD x EAD

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EL = 1.47% x 27.52% x $18,958,036
   = $76,808
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Exposure at default = drawn balance + credit conversion factor x undrawn commitment = $18,000,000 + 47.90% x $2,000,000 = $18,958,036.

Uncertainty: each posterior is treated as a Beta distribution whose concentration is the total evidence behind it (the prior strength plus the observations entered). Drawing PD, LGD and the drawdown factor 20,000 times, independently, gives a 90% credible range for 12-month expected loss of $20,913 to $167,071 (median $65,867). The range is skewed: the median is below the expected loss because rare high-PD, high-LGD draws pull the mean up. Independence understates the range in a downturn, when defaults and loss severity tend to rise together.

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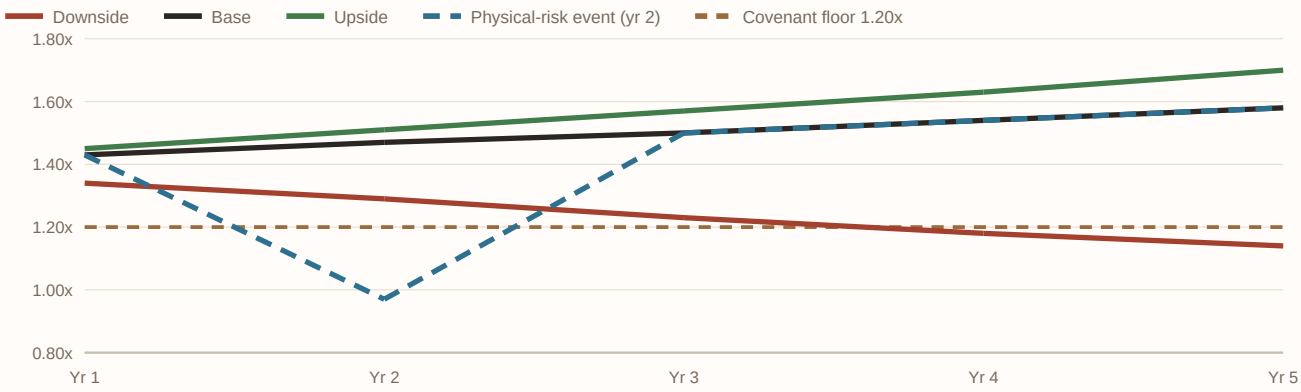
Indicative lifetime view: over the 5-year term, a constant 1.47% annual PD implies a cumulative default probability of 7.15% (1 - (1 - PD)^term) and an indicative lifetime expected loss of $372,894, undiscounted and assuming constant LGD and exposure.

Cashflow scenario analysis

Net operating income is projected at scenario growth rates (Downside -4.0%, Base 2.5%, Upside 4.0% a year) against debt service (amortizing over 25 years) of $1,326,429 a year. Debt service coverage (DSCR) is measured against the 1.20x covenant floor.



Year	Downside		Base		Upside	
	NOI	DSCR	NOI	DSCR	NOI	DSCR
1	$1,776,000	1.34x	$1,896,250	1.43x	$1,924,000	1.45x
2	$1,704,960	1.29x	$1,943,656	1.47x	$2,000,960	1.51x
3	$1,636,762	1.23x	$1,992,248	1.50x	$2,080,998	1.57x
4	$1,571,291	1.18x	$2,042,054	1.54x	$2,164,238	1.63x
5	$1,508,439	1.14x	$2,093,105	1.58x	$2,250,808	1.70x

Covenant breach flagged

Downside scenario: DSCR first falls below 1.20x in year 4.

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Repayment and exit: Standard term loan

Repaid from property income over the term, with the balloon refinanced at maturity. The test below sizes a permanent takeout on Base and Downside NOI at maturity.

BASE REFINANCE COVERAGE
1.50x
Takeout $24,151,214 vs balloon $16,068,875

DOWNSIDE REFINANCE COVERAGE
0.97x
Rate +150 bps, cap +75 bps

DOWNSIDE REFINANCE GAP
$464,328
LTV is the binding constraint

INDICATIVE DOWNSIDE LGD
0.0%
If enforced at maturity; scorecard 27.5%

Repayment and exit findings

- On Downside NOI with takeout rates 150 bps and cap rates 75 bps higher, the refinance gap is $464,328 (coverage 0.97x).

Measure	Base	Downside
NOI at maturity	$2,093,105	$1,508,439
Value at maturity (NOI / exit cap)	$32,201,618	$20,806,062
Largest takeout by LTV / DSCR / debt yield	$24,151,214 / $27,076,876 / $29,901,503	$15,604,546 / $16,573,017 / $21,549,136
Refinance coverage (binding)	1.50x (LTV)	0.97x (LTV)
Refinance gap	$0	$464,328
Exit LTV / debt yield / DSCR	50% / 13.0% / 2.02x	77% / 9.4% / 1.24x

Sensitivity: Refinance coverage at maturity on Base NOI (largest takeout loan / balance)

Takeout rate higher by / Exit cap rate higher by	0 bps	50 bps	100 bps
0 bps	**1.50x**	**1.40x**	**1.30x**
100 bps	**1.50x**	**1.40x**	**1.30x**
200 bps	**1.36x**	**1.36x**	**1.30x**

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Physical-risk scenario: acute rainfall or flood event

A damaging heavy-rain or flood event at the property in year 2, applied to the Base NOI path. In the cash-flow test the owner funds the uninsured repairs, and uninsured repairs and lost rent reduce cash flow available for debt service. In the LGD overlay the event precedes a default with the damage left unrepaired, so uninsured damage and any value discount lower recoveries.

CHANCE OVER THE TERM
22%
1-in-20-year event: 4.88% a year, 1 - e^(-n/T)

MINIMUM DSCR
0.97x
Year 2; breaches 1.20x covenant

UNINSURED COST PER EVENT
$654,771
Expected $32,739 a year

LGD IF DAMAGE PRECEDES DEFAULT
32.30%
From 27.52%; conditional EL $90,162

Return period of damaging event	20 years	**Event year**	2
Repair cost	4% of collateral value	**Insured share of repairs**	60%
Rentable area affected	30%	**Rent lost while repairing**	4 months
Insured share of lost rent	50%	**Operating expense ratio**	40% of gross rent
Post-event value discount	5%	**Collateral after event**	$28,767,200 (from $30,800,000)

Year	NOI	Lost rent (uninsured)	Repairs (uninsured)	Cash flow for debt service	DSCR
1	$1,896,250	-	-	$1,896,250	1.43x
2 (event)	$1,943,656	$161,971	$492,800	$1,288,885	0.97x
3	$1,992,248	-	-	$1,992,248	1.50x
4	$2,042,054	-	-	$2,042,054	1.54x
5	$2,093,105	-	-	$2,093,105	1.58x

Method: lost rent is grossed up from NOI using the operating expense ratio, because expenses continue while rent stops. The LGD overlay assumes recoveries scale with collateral value, LGD' = 1 - (1 - LGD) x (collateral after the event / collateral before). Event probabilities follow the peaks-over-threshold convention. Inputs are illustrative and should be informed by site-specific flood, drainage and insurance information.

What you can do

1. Fix or cap your interest rate before you apply. Rate exposure is the default-risk driver the model weighs most heavily on this loan (rated 7 of 10) because the rate floats. Buying a cap at 6.50% for the term costs a fraction of one year's interest and keeps coverage at 1.27x on the amortizing payment even if rates rise to the cap, comfortably above the 1.20x covenant.
2. Offer a cash-management plan instead of waiting for a covenant problem. In the Downside case coverage falls below 1.20x in year 4. Proposing that excess cash be held back whenever coverage is below 1.30x (it would start in year 2 in that case) shows the lender you have planned for a soft patch, and keeps the cash working for the property rather than for a default.
3. Tie the $2.0m renovation money to completed suites. The chance of further draws before a default is the largest driver of the amount at risk. Ask for draws against completed suites and achieved rents: the lender gets comfort, and you avoid paying interest on money you are not yet using.

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4. Decide how much recourse you will give, and offer it on your terms. Guarantee strength is the largest driver of the lender's loss if things go wrong (rated 6 of 10). A partial repayment guarantee, or a 12-month debt-service reserve of about $1.33m at closing, is usually cheaper than the rate premium or smaller advance a lender would otherwise apply.
5. Track debt yield yourself. A 9.0% debt yield (10.3% today) is a test many lenders use as an early warning. In the Downside case it is approached in year 3 and missed in year 4, which is when to have a plan ready.
6. Close the flood-insurance gap. A 1-in-20-year damaging rainfall or flood in year 2 (a 22% chance over the term) would take coverage to 0.97x that year, with $654,771 of uninsured cost. Insurance covering at least 90% of repair costs keeps coverage at 1.25x; a repair reserve of about $0.5m keeps it at 1.35x. Lenders increasingly ask; have the answer ready.
7. Plan the refinance now. If income comes in at the Downside and rates and cap rates are higher at maturity, a new lender would lend about $15.6m against the $16.1m balance, a $0.5m gap. The cash held back in item 2 can pay that down; agreeing extension terms up front (debt yield of at least 9.0% and loan-to-value of at most 75%) removes the risk of negotiating under pressure.

Methodology and limitations

- PD is a 12-month (annual) probability of default; expected loss is shown on a 12-month basis, with an indicative lifetime figure derived from the cumulative PD over the loan term.
- The posterior is a conjugate Beta-Binomial update of the expert-informed prior with the lender's own observed experience; for LGD and the drawdown factor the observed average is treated as a proportion in the same way. Observed data must come from a source other than the benchmark, or the evidence would be counted twice.
- Credible intervals treat each posterior as a Beta distribution with concentration equal to the prior strength plus the observations. They reflect the evidence behind the scorecards, not model or scenario risk, and the expected-loss range assumes PD, LGD and the drawdown factor are independent.
- This is a public sample: the rating rubric (driver weights, exposure ratings, benchmark rates and prior strengths) is withheld. Reports produced with an access code include it in full.
- Debt service for coverage is the payment on the drawn balance, amortizing over 25 years; the cashflow scenarios stress NOI growth only, and vacancy is not modelled separately.
- The repayment and exit analysis follows how the loan structure is repaid: a refinance test at maturity (term, bridge and repositioning loans) sized on the lowest of LTV, DSCR and debt-yield constraints, a quarterly business-plan projection for transitional loans, and a quarterly unit sell-down for condo inventory loans. Base and downside cases are deterministic; HST, deposit defaults and lender-specific underwriting overlays are not modelled.
- Where included, the physical-risk scenario is a single deterministic event; it does not model flood depth, building-specific damage curves or insurer behaviour, which require site-specific engineering and insurance information.
- This report shows how a lender’s credit model would likely read the loan. It is decision support for the borrower, not a lender’s credit decision or a commitment to lend; every lender applies its own underwriting.

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