McKNIGHT MORTGAGEOS

McKnight MortgageOS Complete User Guide & Manual

Everything you need to integrate, operate, and win with the platform — from your first sandbox key to production document OCR.

McKnight Prequal Engine | Guideline Simulation Engine | Closing Cost Intelligence | Compliance Timing | Mortgage Lead Intelligence | Mortgage Document Intelligence

Base URL
https://mcknight-mortgageos.pages.dev

Version
v1 · July 2026

Support
support@rjbusinesssolutions.org

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Important disclaimer, up front: The AUS engine performs **guideline simulation** modeled on published agency guidelines. It is **not** Desktop Underwriter® (DU®) or Loan Product Advisor® (LPA®) and does not return official findings. All outputs are decision-support estimates — final qualification is always determined by a licensed underwriter and official AUS submission.

01 What Is McKnight MortgageOS?

Mortgage Intelligence is a **mortgage decisioning API platform**: six underwriting-grade engines behind one REST API, running on Cloudflare's global edge network. You send borrower data (or a photo of a paystub) — it returns qualification verdicts, affordability numbers, closing cost estimates, compliance dates, and lead scores in milliseconds.

Who it's for

You are...	You use it to...
Loan officer / broker shop	Pre-qualify borrowers on the phone in real time; screen files before an official AUS run burns a credit pull.
Lender / credit union	Embed instant prequal into your website; run guideline pre-checks across Conventional, FHA, VA, USDA, Jumbo simultaneously.
PropTech / FinTech builder	Power "How much house can I afford?" features with real 2026 guideline math instead of nonsense calculators.
Lead aggregator	Score mortgage leads 0–100 on qualification likelihood before selling or routing them.

The six engines

Prequal

Multi-program qualification, DTI, 0–100 score, max home price, compensating factors

AUS Sim

DU + LPA-style dual verdicts with findings, modeled on published agency guidelines

Closing Costs

TRID-aligned Loan Estimate cost breakdown, all 50 states, cash-to-close

Compliance

LE/CD timing, 3-day waiting periods, mailbox rule, tolerance cure analysis

Leads

Capture + auto-score leads on qualification likelihood, pipeline API

Document OCR

Paystub/W-2/bank statement/1040/1099 → parsed fields → qualifying income → auto-prequal

Platform facts

- <100ms typical engine response
- 2026 loan limits verified
- All 50 states
- Edge-deployed (300+ cities)
- SHA-256 hashed keys
- No SSN required

02 Getting Started in 5 Minutes

Step 1 — Get your free sandbox key (no card, instant)

Visit **mcknight-mortgageos.pages.dev/signup**, or via API:

```
curl -X POST https://mcknight-mortgageos.pages.dev/api/v1/signup \
  -H "Content-Type: application/json" \
  -d '{"company_name": "Acme Lending", "email": "you@acmelending.com"}'
```

The response contains your API key **once** — store it securely. Sandbox includes **25 prequals, 5 AUS runs, and 10 document analyses per month, free forever**.

Step 2 — Make your first pre-qualification call

```
curl -X POST https://mcknight-mortgageos.pages.dev/api/v1/prequal/submit \
  -H "Authorization: Bearer mga_live_YOUR_KEY" \
  -H "Content-Type: application/json" \
  -d '{
    "first_name": "John", "last_name": "Doe",
    "income_sources": [{"income_type": "W2_SALARY", "monthly_amount": 8500}],
    "credit_profile": {"fico_score": 720},
    "debts": [{"debt_type": "auto", "monthly_payment": 450}],
    "down_payment": 60000, "liquid_assets": 45000,
    "property_state": "TX", "years_employed": 4
  }'
```

Step 3 — Read the verdict

```
{
  "qualification": { "status": "Strong - Excellent Approval Odds", "qualification_score": 100 },
  "affordability": { "max_home_price": 374791.27, "max_loan_amount": 314791.27 },
  "program_eligibility": [
    { "program": "Conventional", "eligible": true, "dti_back": 22.1 },
    { "program": "FHA", "eligible": true }, { "program": "VA", "eligible": false, "reason": "..." }
  ],
  "stored_id": "2d42e9c5-..."
}
```

> **That's it.** You now have a qualification verdict, a max home price, and per-program eligibility — from one call. Every submission is stored to your account history (`GET /api/v1/prequal/history`).

Interactive dashboard

The homepage at **mcknight-mortgageos.pages.dev** is a live console: paste your key in the key field, then use the Prequal / AUS / Closing / Compliance / Leads / Usage tabs to fire real requests without writing code. The **Docs** tab lists every endpoint.

03 Authentication, Plans & Quotas

Authentication

All engine endpoints require your API key as a Bearer token:

```
Authorization: Bearer mga_live_xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

- Keys are stored **hashed (SHA-256)** — we cannot recover a lost key; generate a new one via `POST /api/v1/keys`.
- Public endpoints (no key): `/signup`, `/contact`, `/limits`, `/programs`, `/health`, billing checkout.
- Never embed your key in client-side/browser code. Call the API from your server.

Plans

Plan	Price	Prequals/mo	AUS/mo	Docs/mo	Daily calls	Overages
Sandbox	$0 forever	25	5	10	250	—
Starter	$299/mo · $2,990/yr	500	50	100	1,000	$0.75 prequal · $3 AUS
Professional	$999/mo · $9,990/yr	5,000	500	1,000	10,000	$0.40 prequal · $2 AUS
Enterprise	from $2,500/mo	Unlimited + SLA, white-label, custom guidelines				Contact us

Annual billing = **2 months free**. Upgrade self-serve at **/pricing** (Stripe checkout, card charged immediately, account upgraded automatically within seconds via webhook — your existing key keeps working with new quotas). Enterprise: **/contact**.

Checking your usage

```
curl https://mcknight-mortgageos.pages.dev/api/v1/billing/usage \
  -H "Authorization: Bearer mga_live_YOUR_KEY"

{ "tier": "STARTER",
  "prequal":   { "quota": 500, "used": 112, "remaining": 388 },
  "aus":       { "quota": 50,  "used": 9,   "remaining": 41 },
  "documents": { "quota": 100, "used": 23,  "remaining": 77 } }
```

Quotas reset monthly on your billing date (paid plans — triggered by the paid invoice) . Exceeding a quota returns HTTP 403 `QUOTA_EXCEEDED`.

04 McKnight Prequal Engine

`POST` `/api/v1/prequal/submit`

Request fields

Field	Type	Notes
`first_name` , `last_name`	string · required	Borrower name
`income_sources[]`	array · required	Each: `income_type` (W2_SALARY, SELF_EMPLOYED, HOURLY, COMMISSION, BONUS, OVERTIME, RENTAL, PENSION, DISABILITY, ALIMONY...), `monthly_amount` , optional `months_history`
`credit_profile`	object · required	`fico_score` (or per-bureau scores — middle score used), late payments, bankruptcies, foreclosures, collections
`down_payment`	number · required	Dollars available for down payment
`debts[]`	array	Monthly obligations; set `will_be_paid_off: true` to exclude
`purchase_price`	number	Omit to solve for max affordability instead
`property_state` , `occupancy` , `units`	—	Primary / Second Home / Investment; 1–4 units
`is_veteran` , `is_first_time_buyer` , `usda_eligible_area` , `high_cost_area`	boolean	Unlock VA / USDA / high-balance analysis
`interest_rate`	number	Assumed rate for affordability (defaults to current market assumption)

What you get back

- **qualification** — status tier + 0–100 score with contributing factors
- **affordability** — max home price, max loan, est. monthly payment breakdown
- **program_eligibility** — Conventional / FHA / VA / USDA / Jumbo verdicts with front/back DTI vs. 2026 limits, credit minimums, LTV caps, and the specific reason for any failure
- **compensating_factors** — reserves, low DTI, credit depth detected and applied
- **recommendations** — actionable "what would improve this file" list

2026 DTI & program limits used

Program	Front DTI	Back DTI (base/comp)	Min FICO	Max LTV

Conventional	28%	45% / 50%	620	97%
FHA	31%	43% / 50%	580	96.5%
VA	—	41% / 60%	580	100%
USDA	29%	41% / 44%	640	100%
Jumbo	28%	38% / 43%	700	90%

Related: `GET /prequal/history` (last 50) · `GET /limits` + `GET /limits/check?loan_amount=…` (2026 conforming/FHA limits, public) · `GET /programs`

05 Guideline Simulation Engine

`POST` `/api/v1/aus/submit`

> **What this is:** a pre-check that simulates agency underwriting guidelines so you can catch problems before paying for an official DU®/LPA® run. **What this is not:** an official AUS. Findings are modeled, not GSE-issued.

Request shape

```
{
  "loan_number": "L-2026-0455",
  "systems": ["DU", "LP"],              // run one or both simulations
  "borrower": {
    "first_name": "Maria", "last_name": "Santos",
    "credit_score": 705, "monthly_income": 9200,
    "is_self_employed": false, "years_employed": 6
  },
  "property": {
    "state": "FL", "property_value": 450000,
    "occupancy_type": "PrimaryResidence", "units": 1
  },
  "loan_details": {
    "loan_amount": 405000, "loan_purpose": "Purchase",
    "loan_term_months": 360, "interest_rate": 6.5,
    "loan_type": "Conventional", "monthly_debts": 850
  }
}
```

Response highlights

- **Dual verdicts** — DU-style (Approve/Eligible … Refer) and LPA-style (Accept … Caution) recommendation per system
- **Findings list** — each finding has severity, guideline area (credit / capacity / collateral / documentation), and remediation text
- **Documentation checklist** — what an underwriter will ask for on this file
- **Risk factors** — LTV/DTI/credit layering analysis

Submissions persist: `GET /aus/submissions` lists them, `GET /aus/submissions/:id/findings` re-fetches full findings.

When to use AUS-sim vs Prequal

Scenario	Use
Borrower on the phone, exploring budget	Prequal — fast, program-wide, needs less data
File nearly complete, about to submit to DU/LPA	AUS-sim — catch findings before the official run
Website affordability widget	Prequal

Pipeline triage: which files are submit-ready?	AUS-sim in batch

06 TRID Closing Cost Engine

`POST` `/api/v1/closing-costs`

Request shape

```
{
  "loan_amount": 320000, "property_value": 400000, "down_payment": 80000,
  "loan_type": "Conventional", "interest_rate": 6.625, "loan_term_months": 360,
  "state": "TX",
  "discount_points": 0.5, "seller_credit": 5000,
  "property_tax_annual": 7200, "homeowners_insurance_annual": 2100,
  "closing_date": "2026-09-15"
}
```

What it returns — Loan Estimate structure

Section	Contents
A — Origination	Origination fee, discount points, underwriting/processing
B — Cannot shop	Appraisal, credit report, flood cert, MERS, tax service
C — Can shop	Title services, lender's title insurance, survey, settlement
E — Taxes & gov fees	Recording + **state-specific transfer taxes (all 50 states)**
F — Prepaids	Per-diem interest to first payment, insurance year-1, MIP/VA funding fee where applicable
G — Escrow	Initial escrow deposits (months of taxes + insurance)
Cash to close	Down payment + costs − credits, with program-specific items (FHA UFMIP, VA funding fee incl. disabled-vet exemption, USDA guarantee fee)

Every response includes estimated total closing costs, cash-to-close, and monthly payment (PITI + MI where LTV requires it).

> **Tip:** pass `is_veteran_disabled: true` on VA loans to zero the funding fee — a commonly missed exemption worth thousands.

07 Compliance Timing Tools

TRID timing violations are expensive. These endpoints compute legally significant dates using the federal-holiday-aware business day calendar.

Endpoint	What it answers
`POST /compliance/le-timing`	"Given this application date, when must the Loan Estimate be delivered?" (3 business days) — plus earliest allowable closing
`POST /compliance/cd-timing`	"Given this CD delivery date and method, when can we close?" (3-day waiting period; **mailbox rule** adds 3 days for non-hand delivery)
`POST /compliance/tolerance`	"Fee changed between LE and CD — is it a violation and what's the cure?" Zero / 10% aggregate / unlimited tolerance buckets with exact cure amounts
`GET /compliance/holidays/:year`	Federal holiday calendar for any year
`GET /compliance/business-days?start=…&days=…`	General-purpose TRID business-day calculator

Example — CD timing with mailbox rule

```
curl -X POST .../api/v1/compliance/cd-timing \
  -H "Authorization: Bearer mga_live_YOUR_KEY" -H "Content-Type: application/json" \
  -d '{"cd_delivery_date": "2026-09-08", "delivery_method": "mail"}'

{ "received_date": "2026-09-11",      // +3 days mailbox rule
  "earliest_closing_date": "2026-09-15",
  "waiting_period_days": 3, "notes": ["Mailbox rule applied…"] }
```

Example — tolerance cure

```
{ "category": "zero_tolerance", "violation": true,
  "cure_amount": 150.00,
  "explanation": "Lender fees are zero-tolerance; any increase over LE requires a cure." }
```

08 Lead Capture & Scoring

Capture consumer mortgage leads and score them 0–100 on qualification likelihood — so your team calls the winners first (or you price lead inventory correctly).

Endpoint	Purpose
`POST /leads`	Create + auto-score a lead (persists to your pipeline)
`GET /leads`	Your pipeline, sorted by score descending
`POST /leads/score`	Score without persisting (e.g., real-time bid decisions)

Scoring inputs

Credit band, income vs. target price, down payment strength, employment stability, timeline urgency, and property/occupancy type feed a weighted 0–100 score with a hot/warm/cold classification.

```
curl -X POST .../api/v1/leads -H "Authorization: Bearer mga_live_YOUR_KEY" \
  -H "Content-Type: application/json" -d '{
  "first_name": "Dana", "last_name": "Fields", "email": "dana@example.com",
  "credit_range": "700-749", "annual_income": 110000,
  "down_payment_saved": 40000, "target_price": 380000,
  "timeline": "0-3 months", "employment_type": "W2"
}'
→ { "lead_id": "…", "score": 84, "classification": "hot", "factors": [...] }
```

> **Workflow idea:** pipe your web form → `POST /leads` → route score ≥75 to senior LOs, 50–74 to nurture campaigns, <50 to automated drip. The score factors explain every number, so LOs know the angle before dialing.

09 Mortgage Document Intelligence (OCR)

POST `/api/v1/documents/analyze`

Upload a borrower document photo — get back the document type, every extracted field, a computed **qualifying monthly income** per standard agency methods, and (optionally) a full pre-qualification in the same call.

Supported documents & extracted fields

Document	Fields extracted	Income method
Paystub	Pay period, frequency, gross current/ YTD, net, hours, rate, OT/bonus/ commission YTD	Current gross × frequency factor, YTD cross-check (conservative lower figure), OT/bonus flagged for 2-yr average
W-2	Box 1/3/5 wages, withholding, year, EIN, state	Box 1 ÷ 12 (2-yr averaging note)
Bank statement	Balances, deposits, withdrawals, **NSF count**	Asset verification (not income for agency loans)
1040 return	Line 9/11, Schedule C net profit, wages	Sch C ÷ 12 for self-employed (add-back note)
1099	Variant, payer, amount, year	Annual ÷ 12 (2-yr history note)

Upload formats

- **Multipart:** field `file` — JPEG, PNG, or WebP, max 4MB. **PDFs:** convert pages to PNG first (300 DPI recommended).
- **JSON:** `{"image_base64": "...", "content_type": "image/png"}`

The killer feature — document → instant prequal

```
curl -X POST .../api/v1/documents/analyze \
  -H "Authorization: Bearer mga_live_YOUR_KEY" \
  -F "file=@paystub.png" \
  -F "auto_prequal=true" \
  -F 'borrower={"credit_profile":{"fico_score":720},"down_payment":60000,
     "property_state":"NM","debts":[{"debt_type":"auto","monthly_payment":450}]}'

→ doc_type: PAYSTUB · qualifying income: $8,910.30/mo
→ auto_prequal: score 100 · max home price: $374,791 · stored in history
```

Credit score and down payment must come from you — documents can't establish them. The derived income becomes a W2_SALARY (or SELF_EMPLOYED) income source automatically.

09 Mortgage Document Intelligence — continued

Managing analyzed documents

Endpoint	Purpose
`GET /documents/history`	Your last 50 analyses with doc type, confidence, derived income
`GET /documents/:id`	Full record: all fields, income analysis, OCR stats
`DELETE /documents/:id`	**Permanently deletes** the analysis AND the stored file — use for privacy compliance / borrower deletion requests

Accuracy & trust model

- Every response carries a `confidence` (0–1) and a `warnings[]` array flagging legibility issues or inconsistencies (e.g., current gross that doesn't reconcile with YTD).
- The income calculator is deliberately **conservative**: when YTD-derived and current-period figures diverge >15%, the lower figure wins — matching underwriter practice.
- Failed analyses (unreadable image) return HTTP 502 `OCR_FAILED`, **don't consume quota**, and don't store anything.
- Processing takes **15–25 seconds** (two AI model passes). Design your UX accordingly — show a progress state.

> **PII rules for document upload:** obtain the borrower's consent before uploading; redact SSNs and full account numbers where practical. Files are stored encrypted at rest in private object storage, are never used for model training, and are deletable on demand. See **/privacy** §3.

Best-practice image checklist

- Full page in frame, flat, well-lit, ≥300 DPI equivalent (a modern phone photo is fine)
- PNG or JPEG, under 4MB
- Skewed/cropped scans, screenshots of thumbnails, multi-page composites

10 Billing, Upgrades & Usage

Upgrading from Sandbox

1. Go to **/pricing** → click **Subscribe** on Starter or Professional
2. Enter your email (use the **same email as your sandbox signup** to upgrade in place — your existing API key keeps working with the new quotas)
3. Choose monthly or annual (2 months free) → pay via Stripe's secure checkout
4. Within seconds the webhook provisions your account. New customers see their API key **once** on the success page — copy it immediately

Billing lifecycle

Event	What happens automatically
Subscription renews (invoice paid)	Account re-activated if needed; monthly usage counters reset to 0
Payment fails	Account suspended (API returns auth errors) until payment succeeds
Subscription cancelled	Account closed at period end

To cancel or change plans, email **support@rjbusinesssolutions.org** (self-serve portal coming). Annual plans are non-refundable except where law requires.

API key management

```
# Generate an additional production key (returned once)
curl -X POST .../api/v1/keys -H "Authorization: Bearer mga_live_EXISTING_KEY" \
  -H "Content-Type: application/json" -d '{"key_name": "Production Server 2"}'
```

- Use separate keys per environment/server so you can rotate one without downtime.
- Suspected leak? Generate a new key, deploy it, then contact support to revoke the old one.

11 Errors, Limits & Troubleshooting

Error format

```
{ "error": { "code": "QUOTA_EXCEEDED", "message": "Monthly PREQUAL quota exceeded (500/500)…",
"details": {…} } }
```

Error reference

HTTP	Code	Meaning / fix
401	`UNAUTHORIZED`	Missing/invalid key. Check the `Authorization: Bearer` header.
401	`DEMO_KEY_DISABLED`	Demo keys don't work in production — get a free key at /signup.
403	`QUOTA_EXCEEDED`	Monthly quota hit. Upgrade at /pricing or wait for reset.
400	`INVALID_REQUEST`	Missing required fields — message lists them.
409	`ALREADY_REGISTERED`	Signup email already has an account.
413	`FILE_TOO_LARGE`	Document over 4MB — compress or downscale.
415	`UNSUPPORTED_TYPE`	Only JPEG/PNG/WebP. Convert PDFs to PNG first.
502	`OCR_FAILED`	Image unreadable. Retake per the checklist in §09. No quota consumed.

Integration best practices

- **Timeouts:** engines respond in <100ms — set 10s timeouts. Document analysis takes 15–25s — set 60s+ and show progress UI.
- **Retries:** retry 5xx with exponential backoff (1s/2s/4s). Never auto-retry 4xx.
- **Idempotency:** prequal/AUS submissions store a row per call — de-duplicate on your side if users double-click.
- **Monitoring:** poll `GET /health` (public) for liveness; watch your quota via `GET /billing/usage`.

Getting help

Email **support@rjbusinesssolutions.org** with your `client_id` (never your API key), the endpoint, timestamp, and the full error body. Starter: 48h response · Professional: 12h priority · Enterprise: dedicated Slack.

12 Compliance & Legal Notes

> **The disclaimer that governs everything:** This platform provides **guideline simulation and estimation for decision-support purposes**. It is not Desktop Underwriter® (Fannie Mae), Loan Product Advisor® (Freddie Mac), or any official automated underwriting system, and returns no official findings. Final qualification, pricing, and approval are always determined by a licensed lender, official AUS submission, and full underwriting. DU® and LPA® are registered trademarks of their respective owners; no affiliation or endorsement is implied.

Your responsibilities as an API customer

- **Fair lending:** use outputs consistently across all consumers. Never use the API to implement criteria that disparately impact protected classes (ECOA, FHA).
- **Adverse action:** API outputs are not a substitute for compliant adverse-action notices where required.
- **Consumer disclosures:** if you surface results to consumers, present them as estimates, not commitments to lend.
- **Data minimization:** structured endpoints never need SSNs or full account numbers — don't send them. Document uploads require borrower consent (§09).
- **Verification:** TRID timing and tolerance outputs are calculation aids; your compliance team owns the final call.

What we do on our side

- API keys stored as SHA-256 hashes; TLS 1.3 everywhere; documents encrypted at rest in private storage
- 2026 loan limits and guideline parameters verified against published sources (see /brand and README provenance)
- No sale of your data or your borrowers' data. No model training on uploaded documents. Deletion on request (30 days) and self-serve via the documents DELETE endpoint

Full terms: **mcknight-mortgageos.pages.dev/terms** · Privacy: **/privacy** · Governing law: New Mexico, USA.

A Appendix: Complete Endpoint Reference

Endpoint	Auth	Purpose
`POST` `/api/v1/signup`	—	Free sandbox account + instant key
`POST` `/api/v1/contact`	—	Demo / enterprise / partnership request
`GET` `/api/v1/limits · /limits/check · /programs`	—	2026 loan limits & program catalog
`GET` `/health`	—	Liveness + DB status
`POST` `/api/v1/prequal/submit`		Multi-program pre-qualification
`GET` `/api/v1/prequal/history`		Last 50 prequals
`POST` `/api/v1/aus/submit`		DU/LPA-style guideline simulation
`GET` `/api/v1/aus/submissions · /:id/findings`		Submission history + findings
`POST` `/api/v1/closing-costs`		TRID LE-style cost estimate
`POST` `/api/v1/compliance/le-timing · /cd-timing · /tolerance`		TRID timing & tolerance
`GET` `/api/v1/compliance/holidays/:yr · /business-days`		Calendars
`POST` `/api/v1/leads · /leads/score`		Lead capture + scoring
`GET` `/api/v1/leads`		Scored pipeline
`POST` `/api/v1/documents/analyze`		OCR + parse + income + optional auto-prequal
`GET` `/api/v1/documents/history · /:id`		Analysis records
`DEL` `/api/v1/documents/:id`		Delete analysis + file
`GET` `/api/v1/billing/usage`		Quotas + usage
`POST` `/api/v1/keys`		Additional API key
`POST` `/api/v1/billing/checkout`	—	Stripe subscription checkout

Web pages

/ interactive console · **/pricing** plans + subscribe · **/signup** free key · **/contact** demo · **/manual** this guide · **/terms** · **/privacy** · **/brand** brand kit

> **Base URL for every call:** `https://mcknight-mortgageos.pages.dev` — engines respond in <100ms from 300+ edge locations worldwide.