

FOR KARAKOL CITY HALL · 16 OCTOBER 2026

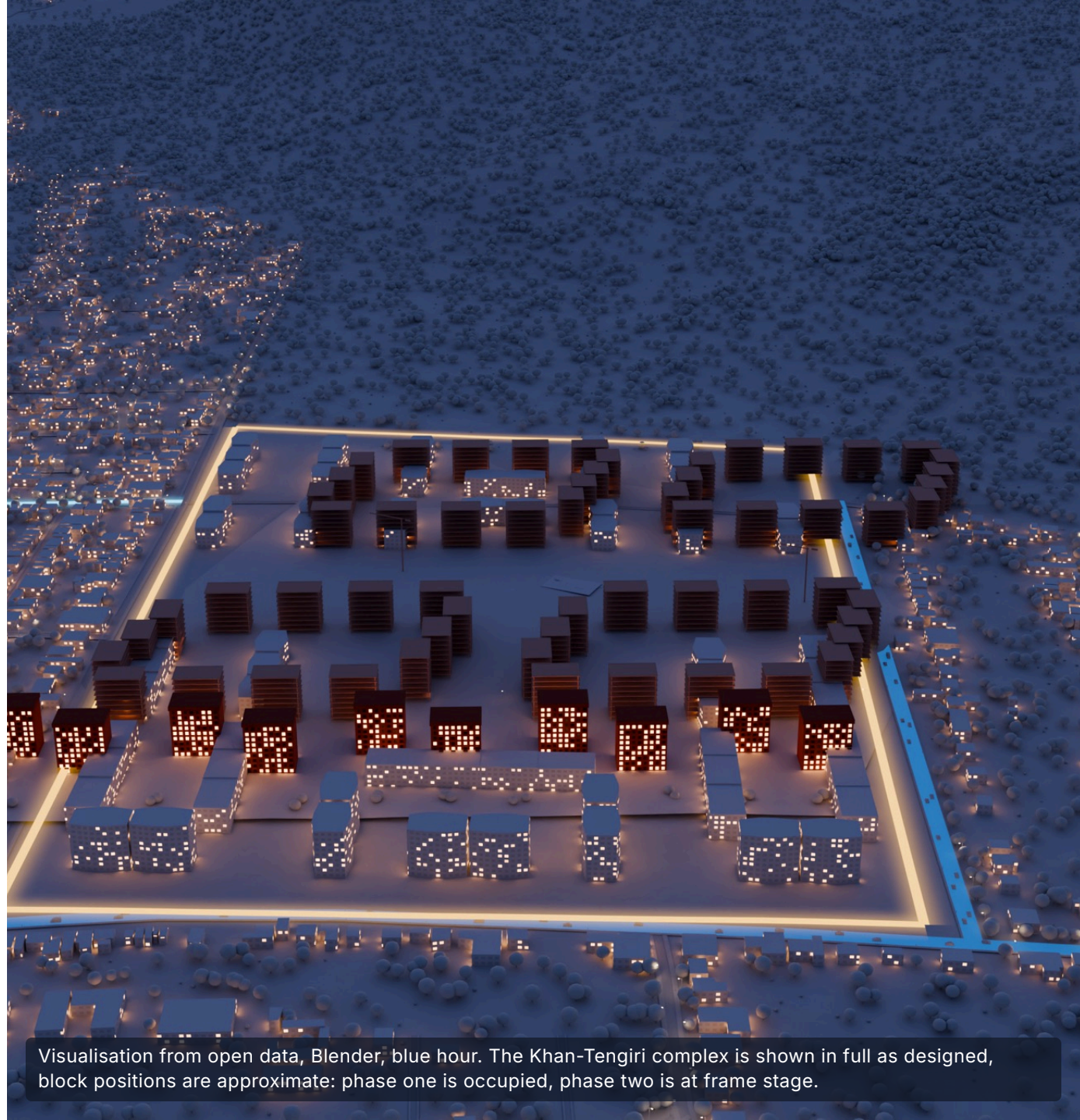
Karakol: digital twin of the city and Khan-Tengiri construction

Everything in this presentation was found and calculated from open sources, without city data: Karakol on real terrain, a dossier on the Khan-Tengiri complex with dated satellite images, construction of one block, and a model of roads and utility networks after move-in.

Open in a browser on a computer or phone:

dvoynik.ordanio.ru/karakol city

dvoynik.ordanio.ru/karakol/stroyka construction



Visualisation from open data, Blender, blue hour. The Khan-Tengiri complex is shown in full as designed, block positions are approximate: phase one is occupied, phase two is at frame stage.

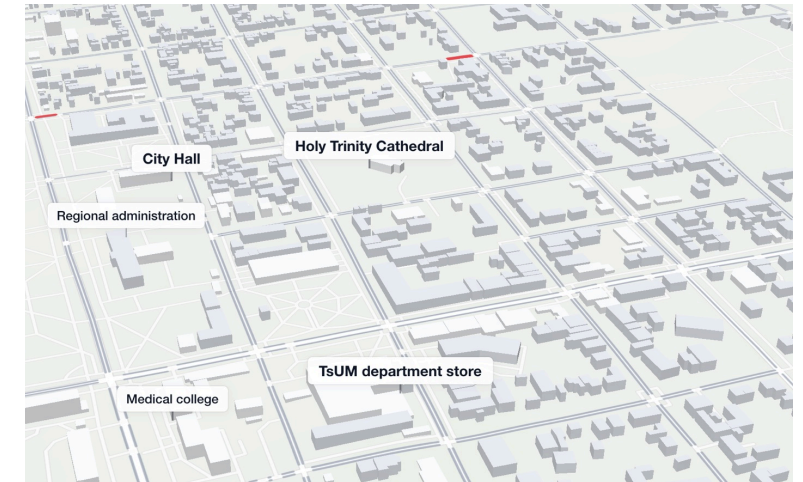
Open sources were enough for a city model, a project dossier and a load model; checking the model against reality requires city data

01 · City	20,397 buildings, streets, terrain and the Terskey Ala-Too range in 3D, opened by a link. Heights of 19,872 buildings are estimated by building type, and the screen says so. Page 3
02 · Project	Khan-Tengiri dossier: 7 official documents from GIK, DGA and OpenStreetMap, 19 media publications, 31 dated satellite images of the site since March 2024. Pages 4–6
03 · Construction	A typical block in nine stages on the real terrain of the site, and a 102.84 m² flat built from the GIK plan with utilities inside the walls. Pages 7–9
04 · Model	Once all phases are occupied: 48 slow road segments instead of 28, 13 overloaded power grid segments instead of 0. These are model results; no city measurements are included. Page 10; what each role sees: pages 12–15
05 · Next	With traffic counts, network schematics and the construction schedule, the model is checked against reality. The first stage on city data takes about 10 weeks. Pages 16–18

Karakol is built on real terrain: 20,397 buildings and 2,034 street segments, with a source stated for every layer



The Khan-Tengiri complex on the edge of Karakol, with the Terskey Ala-Too foothills behind it. The complex is highlighted in terracotta and shown in full as designed, block positions are approximate; the rest of the city is white.



Live screen: Karakol centre with place names from the open map.

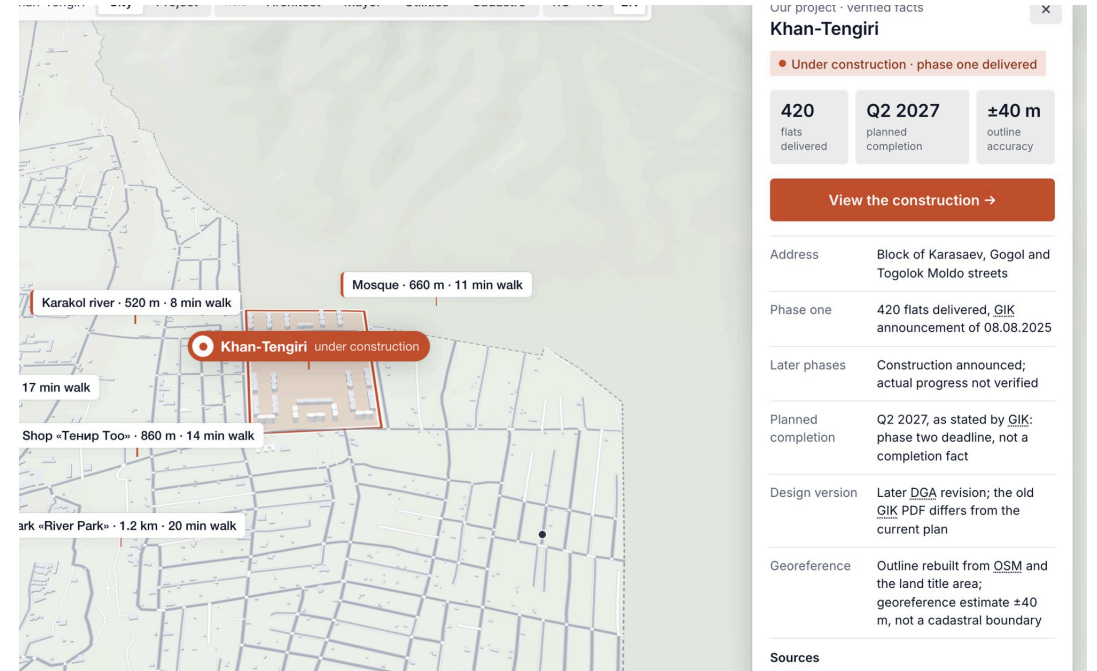
DATA building and street outlines from OpenStreetMap, terrain from Copernicus GLO-30, Sentinel-2 imagery

DATA height for 74 buildings and floor count for 451 buildings from OpenStreetMap

ESTIMATE heights of the other 19,872 buildings by building type

Khan-Tengiri on paper: 69 blocks on 30.6 ha, 420 flats handed over on 8 August 2025, phase two announced for Q2 2027

Location	Togolok Moldo St. near Karasaev St., 30.62 ha by state land deed DGA, 12 Sep 2025
Client	OJSC State Mortgage Company (GIK)
Design	69 blocks; a 10th floor added to 59 of them DGA amendment, 12 Sep 2025
Phase one	10 blocks, 420 flats, keys handed over 8 Aug 2025 GIK announcement
Phase two	28 blocks, 1,430 flats, Q2 2027 GIK documentation, 7 Oct 2025
Not found	contractor, cost, building permit, expert review opinion, work schedule



Live screen: project card on the city map. Distances to the mosque, the river and shops are measured on OpenStreetMap, walking minutes are estimated.

The site outline is reconstructed from OpenStreetMap and the area in the state deed, accuracy $\pm 20\text{--}40$ m. A master plan with coordinates has not been published.

Construction progress is visible from satellite: farmland in March 2024, first shells in November 2024, phase-two frames in October 2026



27 Mar 2024

All farmland, no construction



27 Nov 2024

First shells in the north-west corner. Completion had been announced for December 2024



9 Aug 2025

The day after the keys were handed over: a group of blocks with white roofs



21 May 2026

At least 20 light-coloured frames in the north, west and east of the site



3 Oct 2026

The north is roofed, 8–10 frames without roofs in the south-east, the centre not started

DATA 231 scenes from 1 Jan 2024 to 13 Oct 2026, 141 of them cloud-free over the site; 31 cut-outs downloaded for the dossier. **ESTIMATE** The images were described by eye. Resolution is 10 m: a 20 × 30 m block covers 2 × 3 pixels, floors and finishes are not visible.

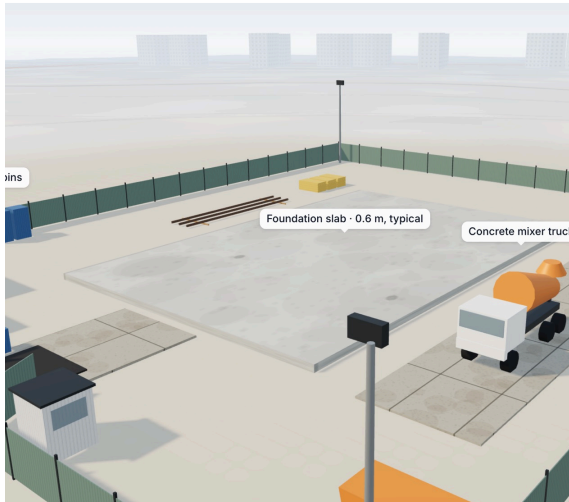
Documents and imagery raise three questions: phase-one timing, the number of flats, phase-two timing; city records answer each one

Item	Announced	Seen in documents and imagery	What will settle it
Phase-one timing	10 blocks by December 2024 Kabar, 6 Sep 2024	Keys handed over on 8 Aug 2025, 8 months later. The image of 27 Nov 2024 shows two shells in the north-west corner	Acceptance certificates for blocks 1–10 with dates
Project parameters	73 blocks of 9 floors GIK design, 5 Jul 2024	69 blocks, 59 of them with 10 floors (DGA, Sep–Nov 2025). Documents give 2,360, 3,105, 3,430 and 3,590 flats	Approved development plan and flat schedule
Phase two	about 400 flats in summer 2026 (GIK, 26 Mar 2026); Q2 2027 (GIK); Q4 2027 (24.kg)	The image of 3 Oct 2026 shows frames without roofs. No reports of phase-two key handover found as of 13 Oct 2026	Work schedule by block and certificates of completed works

This page compares open documents with each other and with imagery. The data says nothing about the reasons for the delays or about violations; GIK and Ministry of Construction documents give the answer.

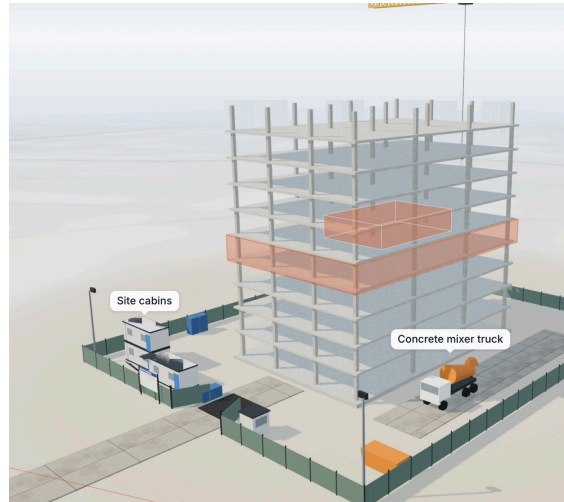
On the construction screen this list is a separate block, “What a buyer should check”: permit, schedule, block placement, typical utilities, prices.

One block is shown in nine stages on the real terrain of the site; the schedule is typical, actual site progress from imagery is marked separately



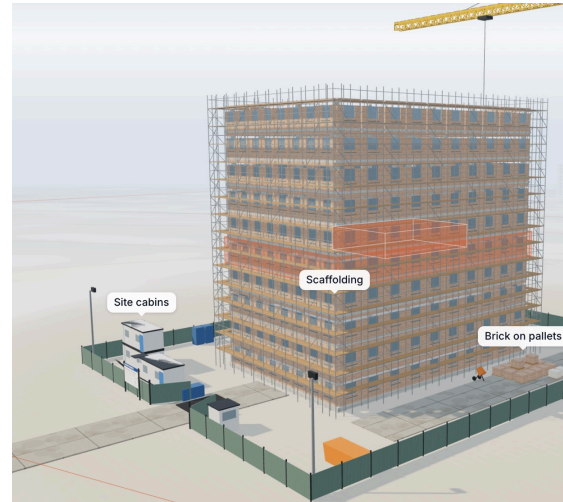
03 Foundation

slab, concrete mixer, formwork



04 Frame · on site now

frames without roofs, image of 3 Oct 2026



05 Walls

250 mm masonry per the GIK design, scaffolding



09 Move-in

yard, parking, playground: typical

Stage quantities are calculated from the GIK design: block 20×30 m, floor height 3.3 m, 250 mm brick. Stage durations come from a typical schedule, because the GIK schedule by block has not been published. Once the city provides the schedule, the stages get real dates.

DATA layout, number of floors, block dimensions

TYPICAL stage durations, machinery, yard, utilities

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The 102.84 m² flat is built from the GIK plan: room areas match the document, utilities in the walls follow a typical design



Visualisation from the GIK plan: furniture and finishes are typical, utility connections follow the codes; GIK will provide the design.



Plan with room areas.



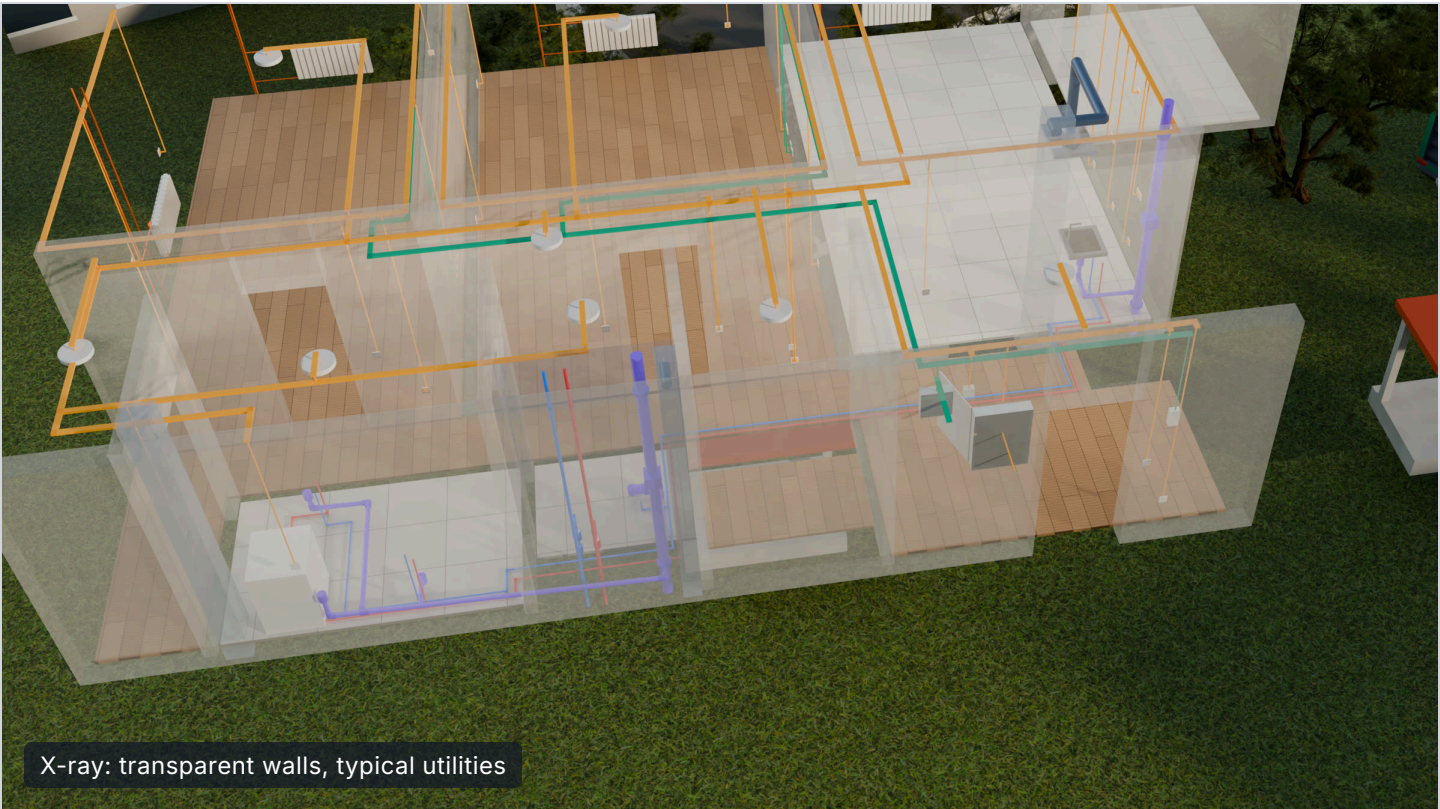
Visualisation from the GIK plan: furniture and finishes are typical, utility connections follow the codes; GIK will provide the design.

The flat page has six modes: X-ray of the walls, walk inside, furniture, evening light, wall section with layers, electrical panel. The flat page opens in a phone browser.

Next to the plan: which way the windows face, distances to the school, clinic and market, and the list "What a buyer should check".

DATA plan and areas: GIK 2025 **TYPICAL** utilities, insulation, finishes, furniture

The flat's utilities follow a typical design: six systems inside the walls, each with fixtures, lengths and heights above the floor



Visualisation from the GIK plan: furniture and finishes are typical, utility connections follow the codes; GIK will provide the design.

Water	V1 cold and T3 hot: 5 fixtures, 2 meters, pipes 17.4 and 19.0 m
Sewerage	2 stacks Ø110, 5 fixtures, Ø50 branches 6.8 m and Ø110 1.1 m, slope 2–3 %
Electrical	29 sockets at 26 points, 8 switches, 10 light fittings, 10 panel circuits, 283 m of cable
Low-voltage	internet 2, TV 2, intercom 1, smoke detectors 4, leak detectors 3, 49 m of cable
Heating	T1 supply and T2 return: 4 radiators under windows, 4 two-pipe risers
Ventilation	3 vent ducts, 3 grilles, hood above the cooker

DATA walls and areas: GIK plan 2025 **TYPICAL** routes, fixtures, heights

After all phases are occupied, slow road segments rise from 28 to 48 and overloaded power grid segments from 0 to 13

28 → 48

road segments below half the speed limit,
07:00–08:00

0 → 13

overloaded power grid segments

0 → 3

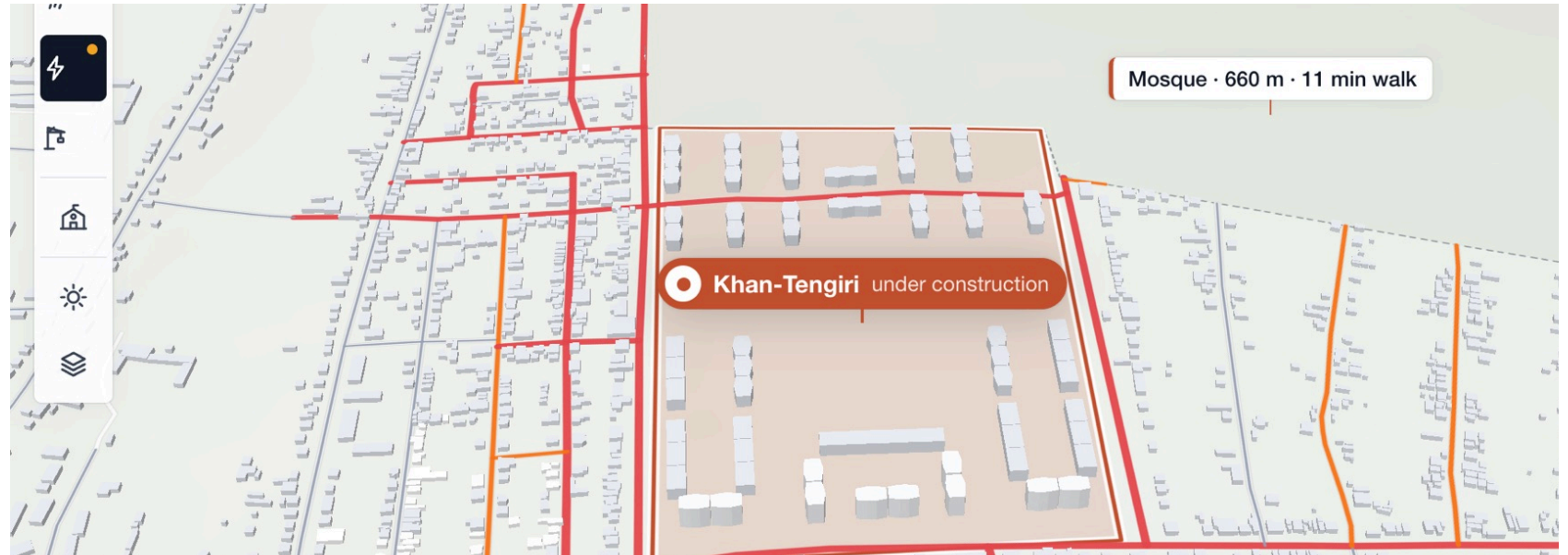
overloaded water main segments

13 → 16

overloaded stormwater segments

+1,074

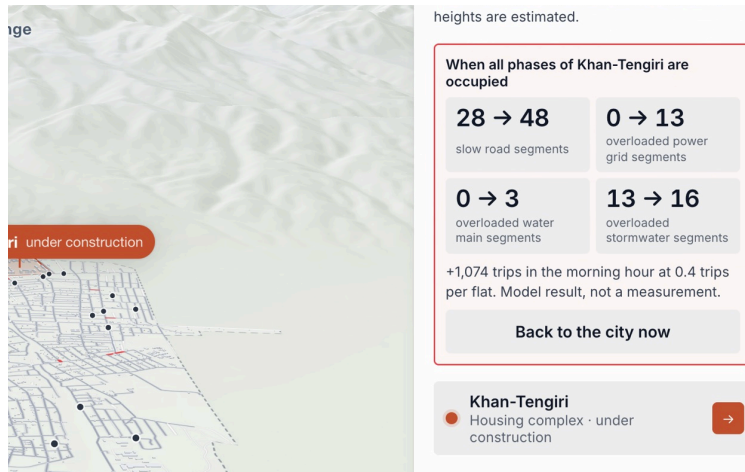
trips in the morning hour on top of 1,800
notional trips in the model baseline (we have
no traffic counters)



Live screen after "Show the city after move-in": around the complex, overloaded network segments in red, segments close to the limit in orange.

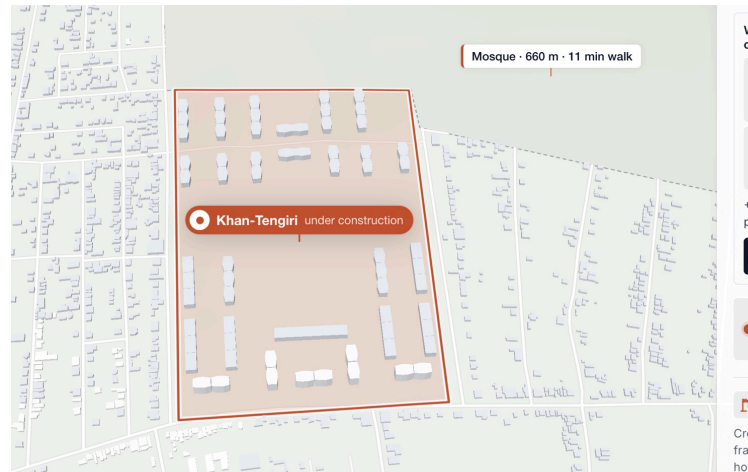
● **MODEL** **How it was calculated.** All 3,105 flats in the complex are occupied (GIK, Aug 2025), 420 of them already are. 2,685 flats added: $\times 0.4$ trips in the morning hour = 1,074 trips, $\times 2.5$ people = 6,713 residents. Traffic is modelled in SUMO 1.28 on OpenStreetMap streets, networks by the SN KR building codes without city network schematics. Red means design capacity is exceeded; it does not indicate a failure of the existing network. The models have not been checked against city measurements.

City Hall gets three tools: checks of new complexes before move-in, construction verified by imagery, answers with sources



New complexes

Before a permit is issued, it is visible which streets and network segments will not cope with move-in and where to reinforce them. For Khan-Tengiri that is 20 new slow road segments and 13 power grid segments.



Construction monitoring

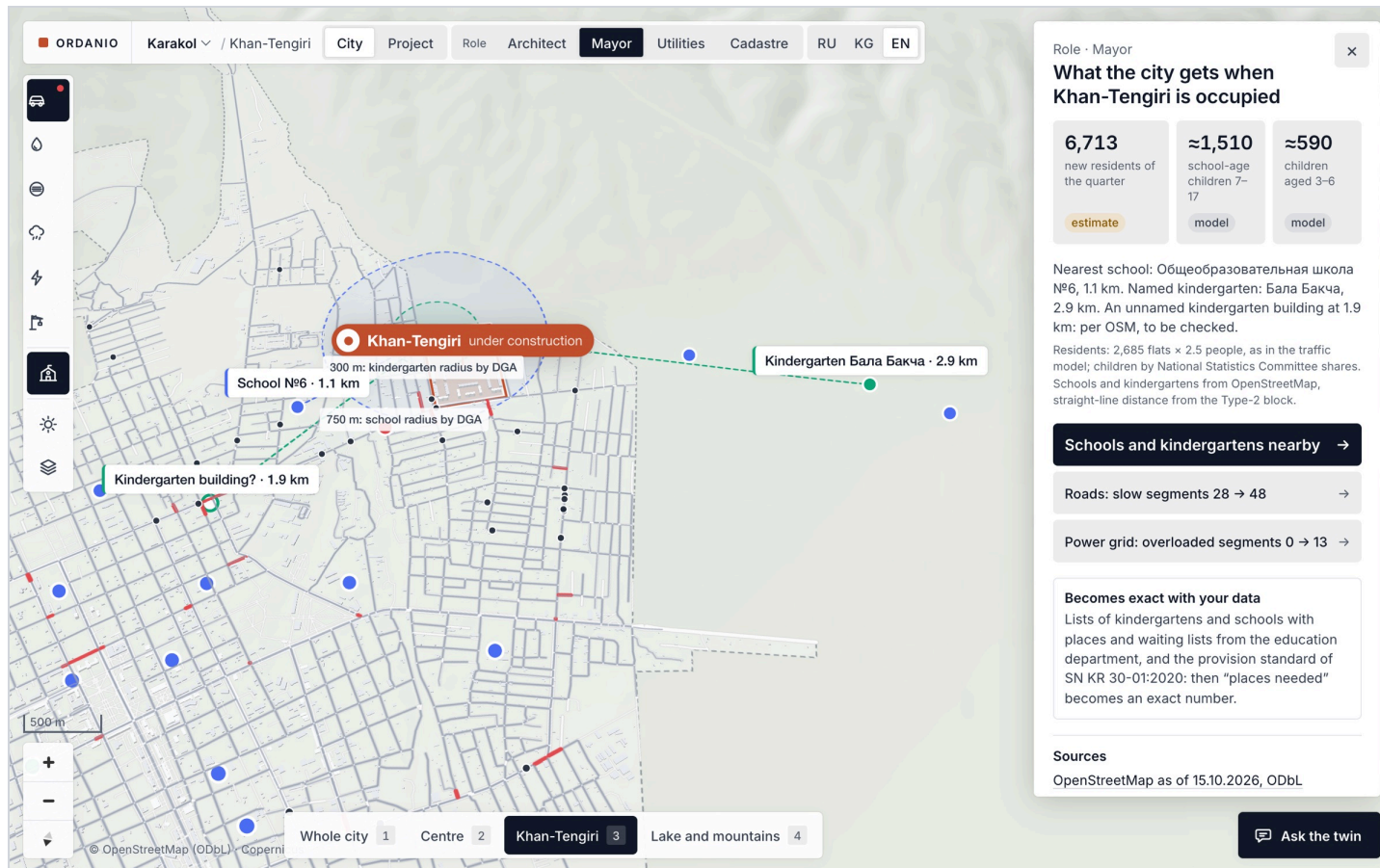
Developer claims are checked against dated imagery and documents: what is built by a date against the promised schedule. For Khan-Tengiri, 7 documents and 31 images have been collected.



Showing to investors and residents

The link can be sent to an investor or opened at a residents' meeting, in Russian, Kyrgyz or English (the frame shows Kyrgyz, machine-translated). The chat answers from the twin's data and names the source of each number.

The mayor sees who the complex will bring: 6,713 new residents, about 1,510 school-age children and 590 aged 3–6, nearest school No. 6 at 1.1 km



6,713

ESTIMATE new residents: 2,685 flats × 2.5 people, as in the road and network model

≈1,510 · ≈590

MODEL children aged 7–17 and 3–6 by National Statistics Committee shares of 22.53 % and 8.82 %

1.1 km

DATA to school No. 6 with 1,070 places; Bala Bakcha kindergarten at 2.9 km

The complex design includes a school for 750 pupils in two shifts and 2 kindergartens of 280 places (DGA, GIK). The “Schools and kindergartens” layer draws 300 and 750 m radii per DGA.

Live screen dvoynik.ordanio.ru/karakol, role “Mayor”, English interface, taken 17 Oct 2026; facility names on the map come from OpenStreetMap as entered, in Russian. Sources: OpenStreetMap as of 15 Oct 2026 (school No. 6: way 1547458212, ODbL), National Statistics Committee of the Kyrgyz Republic, table 5.01.00.01 as of 1 Jan 2025, DGA 12 Sep 2025, GIK 2024. DGA will check the provision standard under SN KR 30-01:2020.

The architect sees sun by date and hour: on 22 December the block's south facade gets 9 hours of direct sun, the north none



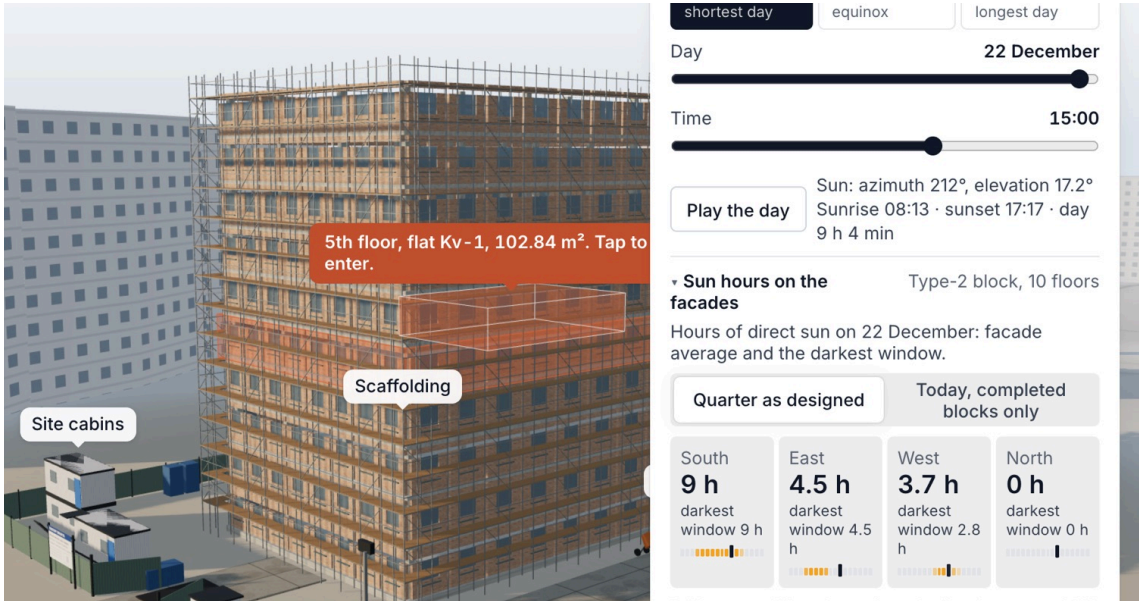
City, role "Architect": shadows of the complex on 22 December at 15:00, sun at 17°.

9 h

south

4.5 h

east



Construction: hours of direct sun on the facades of the Type-2 block and in the windows of flat Kv-1.

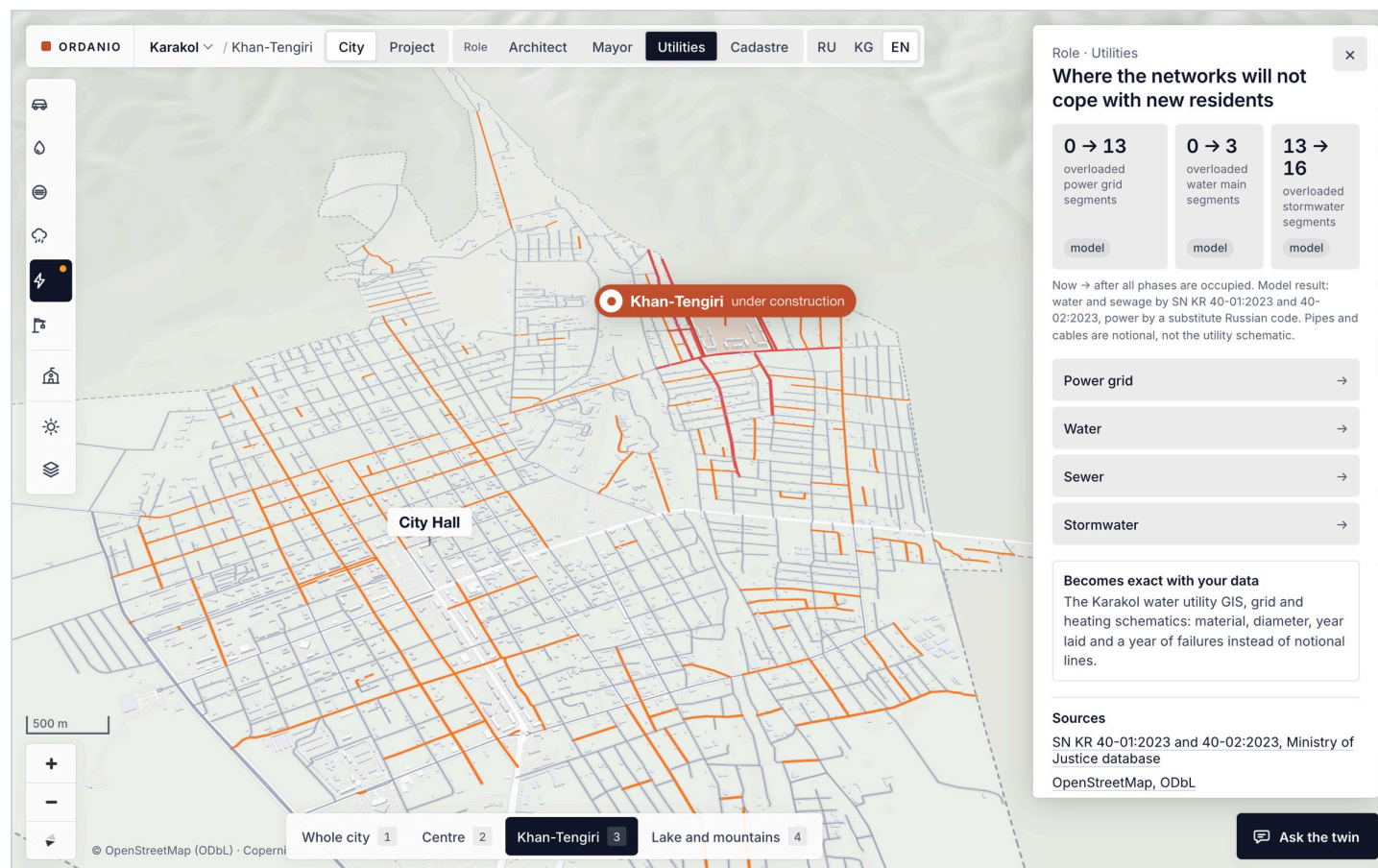
3.7 h

west

0

north

Utilities see the load of the complex after move-in: about 740 m³ of water a day and 5.7 MVA, overloaded power grid segments 13 instead of 0



≈740 m³/day

● **MODEL** water for 6,713 residents by SN KR 40-01:2023, 100–120 l per person: 670–810 m³; sewage 590–740 m³

≈5.7 MVA

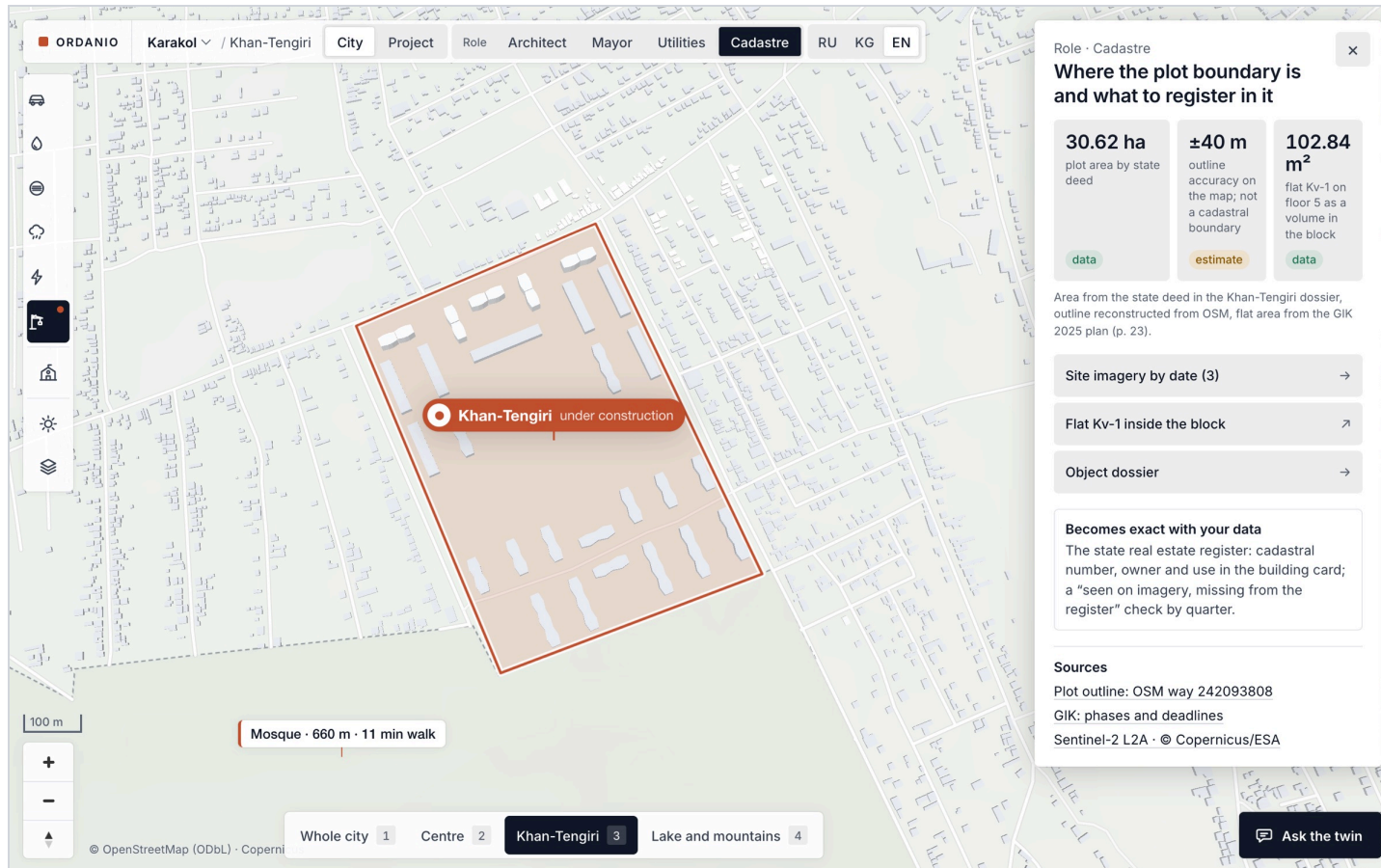
ESTIMATE 2,685 flats × 2 kW = 5,370 kW; 2 kW per flat is our assumption

0 → 13

● **MODEL** power grid segments above the threshold; water main 0 → 3, stormwater 13 → 16

Pipes and cables are notional; this is not the schematic of the water utility or the power distribution company. The Karakolvodokanal GIS and the power and heating network schematics will make them exact.

The cadastre sees a registration object: 30.62 ha by state deed, a map outline to ± 40 m and the 102.84 m² flat as a volume in the block



30.62 ha

DATA plot by state deed, code 2-01-04-01-04-0028, registered 30 Apr 2025

±40 m

ESTIMATE outline reconstructed from OpenStreetMap, 30.56 ha; this is not a cadastral boundary

102.84 m²

DATA flat Kv-1 on the 5th floor per the GIK 2025 plan, p. 23

The code and date are taken from the DGA text; we have not seen a register extract. The cadastral number, owner and building use will come from the state real estate register.

Five things the twin knows only approximately for now; data from city services makes each of them exact

Now	Why	What will close it	Who holds it
Traffic and networks are not checked against measurements	Calculated from codes and the open street map	Counts at intersections, traffic signal timings, network schematics and loads	City Hall, water utility, power grid company
Heights of 19,872 buildings are estimated by type	In OpenStreetMap, 525 of 20,397 buildings have a height or floor count	Number of floors and use of buildings	City Hall, cadastre
Imagery does not show block completion	10 m per pixel; the built-up index sees exposed soil and concrete, it does not see floors	Certificates of completed works, photo records, drone survey	GIK, Ministry of Construction
Construction stages follow a typical schedule	The GIK schedule by block has not been published	Work schedule by block	GIK
Site outline ±20–40 m	The master plan is published without coordinates	Georeferenced master plan, vector drawings of the blocks	DGA, GIK

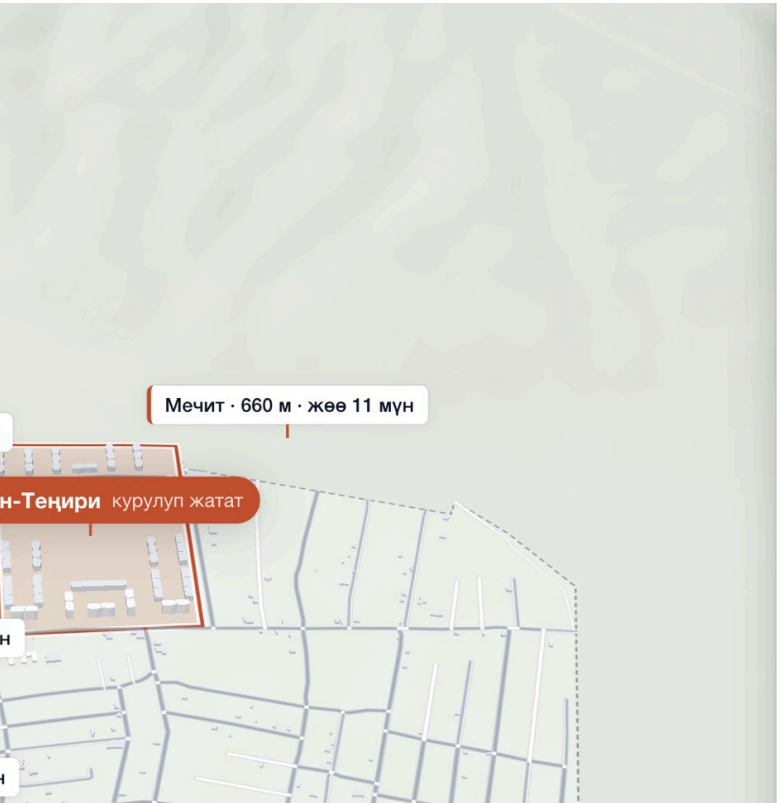
Data from city services is not shown at the open link; closed layers are opened to services by key. Where city data is stored is decided together with City Hall under the contract. Every new number gets a source label, as now.

Six city data sets make the model exact: facades in detail, networks from service schematics, construction from official certificates

Data	In what form	What we build from it	Who holds it
Khan-Tengiri block design	Floor plans, facades, sections in DWG or PDF; finishes schedule	Blocks with real facades, balconies and entrances in place of outline boxes; every flat type, beyond the single one modelled now	GIK, designer
Master plan and landscaping	Georeferenced master plan, design of yards, roads and parking	Outline at ± 1 m instead of ± 40 m; yards, trees, parking and the school in their places; check of the complex against standards	DGA, GIK
Network schematics	Water utility GIS, power and heating network schematics, connection points, substation capacities	Load of the complex on the real network: which segment overloads and when, where to place a substation	Water utility, power grid and heating companies
Cadastre	Vector plot boundaries with numbers, permitted use	A cadastral layer with checks: the plot, what stands on it, what is permitted on it	Cadastre, City Hall
Construction progress	Work schedule by block, certificates, photo records; drone survey	Monitoring against actual progress, more precise than a 10 m image: stage of each block, delay in days	GIK, Ministry of Construction
City	Number of floors and use of buildings, counts at intersections, traffic signal timings	Exact heights in place of estimates by type; traffic checked against counts	City Hall, traffic police

The first two rows are part of the first stage; the rest are connected as services hand over data. The scope and terms of data transfer are agreed at the "List of data" step.

The screen already switches to Kyrgyz and English; a drone survey of the site can add the next layer of the model



Хан- Теңири

• Курулууда · 1-кезек тапшырылды

420
батир
тапшырылды

2027-ж. II
чейрек
пландалган
мөөнөт

±40 м
контурдун
тактыгы

Объекттин курулушун көрүү →

Дареги	Карасаев, Гоголь жана Тоголок Молдо көчөлөрүнүн кварталы
Биринчи кезек	420 батир тапшырылды, МИКтин 08.08.2025 билдирүүсү
Кийинки кезектер	Курулуш жарыяланган; чыныгы даярдыгы текшерилген эмес
Пландалган мөөнөт	2027-ж. II чейрек, МИК жарыялаган: экинчи кезектин мөөнөтү,

dvoynik.ordanio.ru/karakol/?lang=kg. Buttons, layers, cards, construction stages and the data passport in Kyrgyz. Machine translation: a native speaker will proofread it before work with the city. The chat still answers in Russian.

Drone survey of the site

What it is	A pilot films the site in an arc of 30–60 seconds at two heights. The video is turned into a 3D model of the site, switched on as a layer on the project page.
Why	The crane, spoil heaps and roofs appear as the camera captured them. Construction monitoring gets a picture more precise than a 10 m image.
Status	The processing pipeline is built and was run on open video of another site; it did not reach presentation quality there. The Karakol site has not been filmed yet; the first survey will show quality and timing.

The demonstration is open by link already; the first stage on city data takes about 10 weeks

01

Demonstration

ready

The city and the Khan-Tengiri construction open by link. At the meeting we walk through them on City Hall's questions.

02

List of data

timing depends on services

City Hall, the water utility, the power grid company and GIK state which data they hand over and on what terms.

03

First stage

about 10 weeks, estimate

We connect service data, recalculate traffic and networks, monitor Khan-Tengiri construction from imagery and certificates, open access for services, and train two staff members.

The cost of the first stage and of the drone survey is sent on a separate sheet. Prices are in roubles excluding VAT; for the city, invoicing is in soms or US dollars at the exchange rate, and the currency and payment terms are agreed in the contract.

We built the JVC district in Dubai and Dushanbe the same way, from open data. The twins have had no clients yet: the city that starts first gets the terms offered to the first three.

Next step: a meeting at City Hall and a walkthrough of the twin by link on the city's questions.

Everything shown opens by link; data and assumptions are labelled on every screen

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Karakol: the city, roads and networks after move-in, construction monitoring, chat

dvoynik.ordanio.ru/karakol/stroyka

Khan-Tengiri: nine block stages, the flat, the data passport

dvoynik.ordanio.ru/dushanbe

Dushanbe: a second city built the same way (interface in Russian)

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Digital twins of cities and construction projects on open data.

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Sources: OpenStreetMap (ODbL 1.0), Copernicus DEM GLO-30, Copernicus Sentinel-2 (ESA), GIK, DGA, SN KR, publications by Kabar, Ekonomist, 24.kg, Akchabar. Figures as of 15 Oct 2026. Visualisations are built in Blender from open data; they are not photographs.