

A guide · The $500 trillion PPP infrastructure opportunity

Launch a PPP program for Organizations in Karak

WHAT THIS GUIDE IS FOR

Your organization launches a PPP program that turns the projects around Karak's mines, highways, heritage and farms into public-private partnerships (PPPs) it can prepare, bid for, build, finance or operate, starting with the governorate it already works in.

PREPARED FOR
Organizations in Karak, Jordan

PREPARED BY
Saad I. Sahawneh

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INTRODUCTION

A century of infrastructure reaches the end of its useful life

Most of the roads, bridges, power plants, water networks, ports and airports the world runs on were built in the last hundred years, and much of that stock is wearing out at the same time.

The infrastructure of the twentieth century was designed, poured and left to age. It carried the growth of every modern economy, and it was built for a world with fewer people, far less data and a different climate. Pipes leak, grids strain under new demand, and assets designed for one purpose are asked to carry several. Replacing them is the largest building program in human history, and it has already begun.

Rebuilding and running the world's infrastructure will take about $500 trillion over the next fifty years. It is the largest investment humanity will make in that time. Public-private partnerships (PPPs) will carry a large share of it, because governments cannot fund, build and run the rebuild alone, and the private sector cannot do it without them.

How the $500 trillion adds up

	$300T	to build the physical assets: roads, rail, ports, grids, water, cities, schools and hospitals
+	$150T	to operate and maintain them across the life of each concession
+	$50T	for the sensors, compute and robotics that will sit inside them, the share of the rebuild that venture capital can fund
=	$500T	**in total to rebuild and run the world's infrastructure over the next fifty years**

INTRODUCTION

The next hundred years will build Earth's largest computer

For thousands of years the method has stayed the same: design it, pour it, forget it, and repair it when it fails. The next generation of infrastructure will carry a software layer specified alongside the concrete. Assets will monitor their own condition, predict their own failures and schedule their own maintenance, and fleets of machines will raise them with very few human hands involved.

The larger change is the connection between assets. When a port knows what the rail line is carrying before it arrives, a water utility prices its pumping energy against the grid in real time, and every contract and drawing on every project sits in one connected record, the built world starts to behave as one system. Joined across borders, the world's roads, grids, ports, water networks, data centers and satellites become one globally connected, superintelligent computer.

Future infrastructure will be self-building, self-monitoring and self-healing. A road that senses its own cracks can schedule its own repair and use the savings to fund the next stretch. A water network that finds its own leaks can put the recovered water into meters on the next street. Each asset leaves behind the money, the data and the proof for the asset that follows it, so each new project starts further ahead than the last.

The point where the built world starts improving itself faster than anyone can direct it is the infrastructure singularity. Three technologies bring it closer: artificial intelligence designs and runs the assets, robotics builds and maintains them, and tokenization finances them and opens their ownership to everyone. Karak is where the three can meet early in Jordan, because mineral works, cement plants, two highways and a castle town generate the data, the machines and the revenues each of them needs.

Karak has grown around a few large industrial works and its castle, and most of the governorate's organizations have watched the big decisions from the outside. The projects of the next fifty years will be prepared, built and run by many organizations at once, and the ones that start their own programs now will own a share of the governorate they work in. This guide invites organizations in Karak to launch a PPP program, starting with the projects at home.

THE GUIDE

Bring Karak into the $500 trillion PPP infrastructure opportunity

Your organization opens a dedicated PPP program, a team and a set of offers that take part in Karak's mining, industry, transport, water, energy, tourism and urban projects, starting with its place in Jordan's $86 billion of projects.

01 **A Karak PPP team.** A dedicated team that knows how PPPs are prepared, procured and financed follows every project in Karak from the first market sounding and decides early where the organization can prepare, bid, build, finance or operate.

02 **A place in the governorate's consortiums.** Municipalities, industrial suppliers, contractors, farms, hotels and local investors join the consortiums that bid for Karak's projects, bringing the land, the operating knowledge and the local workforce that international partners need.

03 **Projects along the highways and the Ghor.** The potash works at Ghor Al Safi, the cement plants at Qatraneh, the Desert Highway and the King's Highway all depend on water, power, roads and housing. An organization that understands those links can shape projects that serve several of them at once.

04 **Karak-led direct proposals.** Jordan's PPP Law No. 19 of 2023 accepts direct private proposals under Article 15. An organization in Karak can design a project around a need it sees every day, such as a truck stop, a solar pumping plant, a castle visitor center or a cold store for Ghor farms, and propose it with partners who finance and build it.

05 **Pilots as small-scale PPPs.** PPP Regulation No. 9 of 2024 defines small-scale PPPs below $14.1 million, which can be bundled into one feasibility report and one tender. A small concession in Karak gives the organization a live asset, a reference and a place in the larger projects that follow.

JORDAN AND AQABA

An $86 billion pipeline to start with

Jordan has 243 PPP and infrastructure projects in development, worth about $86 billion, of which $46 billion is anchored in Aqaba. The projects that reach Karak will need local partners to prepare, build and run them.

$86 billion
of PPP and infrastructure projects in development across Jordan

$46 billion
anchored in Aqaba, Jordan's only port and its gateway to the Red Sea

SECTOR	PROJECTS	VALUE	WHAT THE PROJECTS WILL BUY
Energy	33	$28.3 billion	Grid and demand forecasting, solar and storage analytics, robotic panel cleaning, predictive maintenance
Tourism	40	$13.8 billion	Visitor flow and demand forecasting, resort and heritage-site operations, booking and payment rails
Urban development	17	$13.8 billion	Digital twins of new districts, digital permitting, modular construction, district operations
Transport	33	$11.7 billion	Traffic and fleet AI, tolling and payments, inspection drones for roads and rail
Industry	31	$8.1 billion	Factory automation, quality verification, industrial sensors and energy management
Water	29	$7.6 billion	Leak detection, pressure management, smart metering, pipe-inspection robots
Mining	15	$1.2 billion	Autonomous drilling and haulage, drone surveying, ore sorting
Health	12	$1.0 billion	Hospital operations AI, patient flow, equipment monitoring
Agriculture	10	$310 million	Precision irrigation, farm robotics, crop and soil monitoring
Environment	15	$270 million	Waste-sorting robotics, emissions monitoring, circular materials
Digital	6	$270 million	Data centers, connectivity, sovereign compute
Education	2	$20 million	School and training campus PPPs, digital learning, building operations and energy retrofits

An organization that delivers one PPP in Karak can carry the same team to Aqaba and to the next project across Jordan. Aqaba concentrates ports and terminals, logistics, rail to the port, industry, energy, water and tourism inside the Aqaba Special Economic Zone, which makes it a single place to test port automation, logistics software, desalination and energy technology on assets that connect Jordan to the world.

SECTOR GUIDES

Jordan's $86 billion, sector by sector

Jordan is investing in and advancing 23 sectors at once, and together their projects make up the $86 billion. A sector guide for each lists every project in it, its link to the infrastructure singularity and the ways a partner can take part.

The sectors closest to organizations in Karak

Fertilizers and Chemicals	Arab Potash at Ghor Al-Safi and Jordan Bromine, the world's second-largest bromine producer. 14 projects, $6.5bn of forward investment. www.JordanPPP.com/sectors/chemicals
Oil, Gas and Power	Attarat 470 MW oil-shale power plant, plus the El-Lajjun oil shale concession. 23 projects, $15.1bn of forward investment. www.JordanPPP.com/sectors/oil-gas
Mining and Minerals	Dead Sea minerals, oil shale, gypsum and cement raw materials. 29 projects, $1.2bn of forward investment. www.JordanPPP.com/sectors/mining
Tourism	Karak Castle, Wadi Mujib and Wadi Bin Hammad, the southern Dead Sea. 56 projects, $13.8bn of forward investment. www.JordanPPP.com/sectors/tourism
Agriculture and Food	Ghor Al-Safi year-round tomatoes and bananas; poultry farms covering 33% of national consumption. 28 projects, $400m of forward investment. www.JordanPPP.com/sectors/agriculture

All 23 sector guides

Oil, Gas and Power	$15.1bn	Wastewater and Reuse	$946m
Tourism	$13.8bn	Nuclear Energy	$835m
Urban Development	$12.8bn	Agriculture and Food	$400m
Green Hydrogen	$10.6bn	Solar Power	$326m
Transport	$8.1bn	Digital and AI	$243m
Water	$6.7bn	Circular Economy	$189m
Fertilizers and Chemicals	$6.5bn	Wind Power	$186m
Ports and Logistics	$3.6bn	Pharmaceuticals	$128m
Manufacturing	$2.4bn	Creative Industries	$47m
Storage and Grids	$1.4bn	Defense	$10m
Mining and Minerals	$1.2bn	Education and Skills	$7m
Health	$986m		

Every sector guide can be read and downloaded at www.JordanPPP.com/sectors.

ARTIFICIAL INTELLIGENCE

AI designs, structures and runs it

A PPP takes about seven years from concept to financial close and costs roughly 10% of capex to structure. Almost all of that work is documents and models, which is the work AI does well.

What changes

When the cost of intelligence approaches zero, the cost of preparing a project falls with it. Feasibility studies, options appraisals, cost plans, risk matrices, financial models and tender documents can be produced and tested in days, and contracts can be drafted and stress-tested in hours. PPP projects will soon appoint an AI technical advisor alongside the human ones. Once an asset is running, the same intelligence operates it: a digital twin models the asset in real time, sensors report wear and faults early, and maintenance follows the data.

Jordan arrives late to PPP software, and that is an advantage. With few legacy systems to migrate off, AI-native tools can be built from the ground up, and the reasoning behind each decision can be captured inside the transactions being structured today.

What it means for organizations in Karak

AI fits Karak's heaviest systems first. It can plan mineral and cement haulage, forecast truck flows on the Desert Highway and the King's Highway, balance water and power demand for industry and farms and guide visitors at the castle. An organization in Karak can bring those tools into every concession it joins and use the same data to find the next project worth proposing.

What will be built

Project preparation	Software that turns feasibility studies, cost plans and tender documents into a repeatable process, so the years spent before tender shrink to months.
Procurement	Tools that let ministries compare bids on whole-life cost and deliverability.
Cost estimation	A national benchmark database that prices every project against real Jordanian rates.
Contract intelligence	Assistants that read, compare and answer questions on every contract, drawing and instruction on a project in plain language.
Asset monitoring	Sensors and digital twins that tell an operator what will fail before it fails.
Permits and approvals	Digital workflows that replace the paper trail across ministries, municipalities and utilities.

ROBOTICS

Robots build it and keep it running

Most of the $500 trillion of infrastructure due over the next fifty years will be built by machines, and people will design, train and supervise those machines.

What changes

Autonomous software combined with autonomous machines produces autonomous infrastructure. Tunneling machines, construction robots, drones and modular factories already raise structures with far fewer people on site. The machines then stay with the asset: drones inspect bridges and power lines, robots travel inside pipes to find leaks, and cleaning robots keep solar fields at full output.

Robotics also changes who can compete. A small company with the right machines can build what once needed a thousand-person contractor, and it can prove its method on a pilot before anyone asks for a track record, which opens PPP work to new companies for the first time.

What it means for organizations in Karak

Mines, quarries and cement plants are where robots already work at scale. Autonomous haul trucks, drones and inspection robots can raise the output of Karak's industrial sites and keep its pipes, roads and power lines in shape, and the organizations that run them will need Jordanian technicians trained in Karak to operate and maintain them.

What will be built

Water networks	Robots and acoustic sensors that find leaks inside the network, in a country that still loses about 41% of its water to leaks, theft and faulty meters.
Construction	Modular methods, on-site automation and quality verification suited to Jordan's labor market.
Inspection	Drones and crawlers that survey roads, bridges, rail, power lines and pipelines and report defects automatically.
Energy	Robotic cleaning and maintenance for solar fields, and retrofit technology for public buildings, street lighting and water pumping.
Mining	Autonomous drilling, haulage and drone surveying for phosphate, potash and new mineral projects.
Ports and logistics	Automated handling, yard robotics and drone delivery for Aqaba's terminals and Jordan's dry ports and border crossings.

TOKENIZATION

Tokenization finances it and opens its ownership

A PPP absorbs capital over four years and releases it over thirty. Today's investors expect to enter and exit easily, and tokenization gives them that option.

What changes

A concession is a long-dated, contracted, inflation-linked cash flow, the kind of asset a token represents well and an ordinary investor has rarely been able to hold directly. Tokenization lets a small pilot be funded by a few hundred investors, with returns paid automatically from the asset's own revenue and no lender between them.

The rails already exist in the region. ADGM regulates tokenized securities, the Dubai Land Department records tokenized title deeds on its own register, and Jordan adopted a national Blockchain Technology Policy in December 2024. Tokenized concession revenues are still rare, so the first tokenized PPP in Jordan is open to whoever builds it.

PPP companies will be tokenized before PPP projects, because a developer already gathers projects, risks and revenues into one entity. People will own the builders first, then the portfolios, then the projects, and at the end of that sequence sits a stock exchange for the physical world.

What it means for organizations in Karak

Tokenization lets the people and companies of Karak own a share of the projects around them. An organization can offer tokenized stakes in a solar plant, a water network or a heritage hotel to local and regional investors, pay them from the asset's own revenue and keep the governorate's savings working at home.

What will be built

Issuance	Compliant token issuance for PPP companies, infrastructure funds and small pilots.
Investor onboarding	Identity checks, suitability and custody built for Jordanian and regional investors.
Revenue distribution	Smart contracts that pay holders from tolls, tariffs and availability payments as the money arrives.
Registries	Shared records of contracts, milestones and asset performance that every party can trust.
Secondary markets	Venues where holders can buy and sell stakes in operating infrastructure.
Citizen participation	Tools for citizens to propose projects, vote them up and invest small amounts in what gets built.

SMALL PPPS IN PARALLEL

A thousand small PPPs teach more than one large one

The World Bank counted 315 private infrastructure projects reaching financial close across all low- and middle-income countries in 2024, only a few per country. No country can learn quickly at that pace, and each lesson arrives years after the technology behind it has moved on.

Each of those projects is too large, too slow and too expensive to try anything new on, and every approval, guarantee and stakeholder on a $1 billion project pulls it toward the way things were done before. Small projects are where a new idea can afford to be wrong, because the downside is small, the learning cycle is fast and the bureaucracy is thin.

Run them in parallel

Software has already moved from building one idea at a time to building ten at once, and infrastructure can follow. Picture 100 small schools built within six months, each delivered through its own PPP and each testing a slightly different legal structure, financing model, construction method and operating approach. Performance data arrives quickly, the models that work are copied, the weak ones are retired early and policy improves with every round, so a thousand small projects teach a country tens of thousands of lessons where one large project teaches a few.

$10M	spent preparing a single $100 million PPP, enough to build 100 pilots at $100,000 each
780	small PPPs a year in Jordan at $100,000 each, from 1% of the budgets of its 40 contracting authorities, about $78 million, in a country that closes only a handful of PPPs a year today
97,500	small PPPs a year if every country ran 500 at $100,000 each, for $9.75 billion, less than the price of one metro line

The PPP singularity

The PPP singularity is the point at which it becomes cheaper to build the pilot than to conduct the study. One feasibility study can make a project look feasible, another can make it look unfeasible, and the decision still comes down to judgment, while a pilot settles the argument with evidence. Governments that work this way become portfolio managers of experimentation: they set the objectives and the guardrails, standardize contracts that can adapt, collect the data and publish every pilot, every cost and every failure on one public website.

PPP RESEARCH LABS

Pilots need somewhere to live

PPP innovation needs the public and private sectors working together, so each lab is built the way a PPP is built: the public sector spearheads it and the private sector designs, finances, builds and operates it.

One lab per sector	Water, power, transport, aviation, health, education, agriculture, digital, tourism and urban development each get a lab inside the ministry or authority that runs the sector.
A one-line brief	Run ten small PPP projects a year at up to $100,000 each, testing new technologies, new PPP frameworks, new construction methods and new financing structures.
A PPP itself	The ministry tenders the lab, and private companies bid to design, finance, build and operate it with their own capital, effort and technology.
Funding	About $1 million a year per lab, found by moving 1% of an authority's budget away from inefficient spending. Ten labs can run a hundred experiments a year on a modest budget.
Open results	Every result is published as it happens, including the failures: what worked, what failed and what the contract should have said. The lessons go straight into the large PPPs already running and the ones still to come.
Room to explore	Labs carry no fixed deliverables, because predetermined outputs defeat the purpose of research, and they are judged on engineering results.

Who builds and who funds

Small projects open PPPs to founders and small companies. On a large concession a bid costs 3% to 5% of capex, prequalification asks for a decade of comparable projects and performance bonds run to tens of millions. AI cuts the bid cost, robotics cuts the crew a project needs and tokenization lets a few hundred investors fund a pilot, so a small PPP moves at the speed of the founders running it. Venture capital funds the technology, infrastructure funds finance the assets, and a $10 billion fund raised by both, deploying $2 billion in its first year, could back 20,000 small PPPs, about 100 in every country.

What it means for organizations in Karak

Karak is small enough to test a new idea quickly and varied enough to prove it. An organization in Karak can host a PPP research lab, run pilots on its own land and assets and publish every result, so the pilots that work in Karak become the models for the rest of Jordan.

UNSOLICITED PROPOSALS

Jordanian law accepts unsolicited PPP proposals

Any private company can take its own PPP idea to government. Article 15 of PPP Law No. 19 of 2023 lets a proposer submit a direct proposal to the Ministry of Investment or a public authority, and PPP Regulation No. 9 of 2024 sets out how it is assessed.

How a direct proposal works

Conditions	The proposal offers an innovative solution for a public service, is prepared on the proposer's own initiative, gives value for money, fits government programs, covers the government's obligations from project revenues and discloses any conflict of interest.
Contents	The scope, the proposer and its experience, a pre-feasibility study with the innovation and intellectual property behind it, the fiscal implications and any support or guarantees sought, and the cost of preparing the study.
Review	A public authority or municipality that receives a proposal refers it to the Ministry, which has 60 days to take it up for study or return it unopened, and can charge a study fee of at least $7,050.
Registry	A qualifying proposal is listed as a PPP project in the national registry of public investment projects, and one that falls short is rejected.
Tender	If the project goes to tender, the proposer can match the best offer, and if another bidder wins, the winner repays the proposer's direct study costs.
Small projects	Projects with a capital cost below $14.1 million are small-scale PPPs, and similar ones can be bundled into one feasibility report and one tender under simpler procedures.

Limitless ideas

This is the Swiss Challenge approach: the proposer brings the idea, the market competes on it and the proposer keeps the right to match the best offer. Many of the projects in Jordan's $86 billion pipeline are still early enough for a partner to shape the deal or bring its own idea, and a direct proposal can be as large as a mini city built and operated under one contract or as small as a $100,000 pilot. The PPP research labs can be proposed the same way, and every company with an idea for a public service becomes a possible project sponsor.

What it means for organizations in Karak

A direct proposal lets an organization in Karak bring a project built around a need it knows better than anyone, from a truck stop on the Desert Highway to a visitor service at the castle. It can propose the project as its own, protect the ideas behind it and keep the right to match the best offer at tender.

WHY ORGANIZATIONS IN KARAK

Karak's organizations can build the place they work in

Karak holds Karak Castle, the potash works on the southern Dead Sea, the cement plants at Qatraneh and Mutah University. Each new project depends on the organizations already working there, and each one can make them partners in what is built.

Where organizations in Karak fit in a PPP

Preparation	Local data, land and needs that shape projects the governorate can use and investors can finance.
Tender	Places in consortiums beside international developers, contractors and operators.
Financial close	Equity, land contributions and local investors beside the banks and funds.
Operation	Operators, service firms and a workforce that run the asset in Karak for decades.
Exit	Stakes that local and regional investors can buy, including tokenized notes.

One governorate, many linked projects

Mineral works and cement plants, the Desert Highway and the King's Highway, water and power networks, the farms of the Ghor, the castle and the old town and the campus at Mutah all depend on each other in Karak. A project in one of them changes the demand for the others, which gives organizations that see the whole governorate an advantage in shaping the next one.

Why a program, and why now

The consortiums for Jordan's next projects are forming now. A program gives an organization in Karak a team, a pipeline and the partners to act on it, and the organizations that join the first projects will help set the standards the rest of the governorate follows.

THE PROGRAM

How the program could work

The program can sit inside the organization's strategy or business development team, with a PPP lead at its center and offers built from what the organization already owns and runs in Karak.

PPP team	A small team of business, technical, legal and finance people that covers every PPP in Karak from the first market sounding.
Pipeline	A map of Karak's projects by sector and stage, and the ones that fit the organization's land, assets and skills.
Consortia	Partnerships with developers, contractors, operators and banks bidding for Karak's projects.
Local supply	Services, staff, land and equipment the organization can offer every concession in the governorate.
Direct proposals	Projects proposed under Article 15 around needs the organization sees in Karak every day.
Pilots	Small-scale PPPs below $14.1 million that build a track record on live assets in Karak.
Partners	Agreements with the governorate's public bodies, municipalities, industries, investors and other organizations in Karak.

What the organization gains

The organization gains contracts and revenue that last as long as the concessions it joins, a bigger role in the governorate it already works in and a reference it can carry to every other project in Jordan.

It also gains a voice in how Karak grows. The organizations that help prepare, build and run the governorate's first AI, robotics and tokenized PPPs will shape its industry, its highways and its heritage for the next fifty years.

ABOUT

Jordan PPP

Accelerate Jordan
Accelerate the infrastructure singularity
Accelerate the Jordan PPP singularity

AMMAN, JORDAN WWW.JORDANPPP.COM

Jordan PPP helps every kind of organization in Jordan launch a public-private partnership (PPP) program of its own. It publishes 96 guides, one for each kind of organization, from the Royal Hashemite Court and Parliament to banks, contractors, universities, humanitarian organizations, companies in twenty-one sectors and organizations in twelve governorates.

Its vision is the infrastructure singularity, when roads, grids, ports and water networks become one globally connected, superintelligent computer, built by robotics, run by artificial intelligence and financed by tokenization. Rebuilding and running the world's infrastructure will take about $500 trillion over the next fifty years.

Its method starts small: a PPP program for every organization, small PPPs run in parallel, a research lab in each sector and direct proposals under Article 15 of PPP Law No. 19 of 2023, starting with Jordan's $86 billion and Aqaba's $46 billion of projects.

JORDAN PPP

What Jordan PPP offers

The guides

One for every organization

96 guides, each with the case, the program and six first steps.

www.jordanppp.com/guides →

The summary

All guides in one document

Every guide, its organization and its ask, in one place.

www.jordanppp.com/summary →

Futureproofing

AI, robotics, tokenization

What the three technologies change for every organization.

www.jordanppp.com/futureproofing →

The opportunity

$500 trillion

The $500 trillion PPP infrastructure opportunity, from the crisis to the exchanges.

www.jordanppp.com/opportunity →

NEXT STEPS

How an organization in Karak can start

Any organization in Karak can take this guide forward. The first steps use the land, assets, people and partners the organization already has.

Mandate	Board or management approval for a Karak PPP program, with its sectors, its role and its first-year goals.
Team	A named program lead, with business, technical, legal and finance people drawn from the organization's existing teams.
Pipeline	A map of Karak's share of Jordan's $86 billion by sector and stage, and early meetings with the authorities and developers behind them.
Offer	The land, assets, services and local workforce the organization can bring to a consortium, packaged into one offer.
Partners	Developers, contractors, operators, banks and other organizations in Karak ready to bid together.
Pilot	A first consortium bid, small concession or direct proposal in Karak, taken from idea to submission.

Karak has the minerals, the highways, the castle and the land, and Jordan has a law that lets an organization propose its own projects. A PPP program puts your organization at the center of how the superintelligent infrastructure future arrives in Karak.

PREPARED BY
Saad I. Sahawneh

LINKEDIN
linkedin.com/in/saadsahawneh



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