

⚡ INSTITUTIONAL MOBILITY & LOGISTICS STACK • PAKISTAN EDITION

The Complete Ride–Hailing, Bidding & Logistics Operating System

A high-concurrency mobility platform combining **Real–Time Fare Bidding**, **Fixed–Meter Dispatch**, **Multi–Modal Courier Delivery (with Photo POD)**, and native **Easypaisa & JazzCash Settlement** for private transport operators.

 Laravel 12 REST API

 Flutter 3.x Native Apps

 Python 3.10 High–Load Suite

 MySQL 8 Spatial GIS

 Firebase FCM HTTP v1

 Easypaisa & JazzCash Rails

100%

COMMERCIAL OWNERSHIP

Zero foreign commission leakage. Retain 100% of revenue in Pakistan.

Dual Mode

BIDDING + METERED RIDES

Passengers & drivers freely choose between Fare Bidding or Meter dispatch.

1,200+

PEAK RPS CAPACITY

Engineered to sustain 5,000 active concurrent sessions on lean hardware.

< 45ms

SPATIAL LATENCY

Sub-second spatial indexing for nearest driver discovery & ETA.

ENTERPRISE ARCHITECTURE BLUEPRINT

1. Complete Technology Stack Matrix

The Yello platform is engineered as an enterprise-grade distributed system across four decoupled technology tiers:

4-Tier Distributed System Architecture

TIER 1 Mobile Client Layer (Flutter 3.x / Dart 3.4+)

Passenger App

iOS & Android · Bidding + Meter

Driver Partner App

iOS & Android · Bids + My Route

Fleet Owner App

Multi-Vehicle · Shift Assign

↓ OAuth2 Bearer Token / JSON REST API ↓

TIER 2 Web Consoles Layer (Blade / JavaScript / Spatial Leaflet)



Super Admin Control

God's Eye · Zones · 80+ RBAC



Ride Dispatcher (/dispatch)

Call-Center · Customer Pin



Logistics Dispatcher

/dispatch-delivery · Parcel Radar



Fleet Owner Portal

Vehicle Ledger · Driver Shifts



Enterprise Showcase

/enterprise & /partner-guide

↓ Encrypted HTTPS Session / WebSockets / Supervisor Queues ↓

TIER 3 Application & Compute Layer (Laravel 12.x / Python 3.10+ / Redis)



Core REST API Server

Laravel 12.x · PHP 8.2 · Spatial Routing



Async Queue Workers

Supervisor · Redis Priority Queues



Simulation & Telemetry

Python 3.10+ · AsyncIO Stress Suite



Notification Engine

Firebase FCM HTTP v1 OAuth2 Wakeup

↓ High-Speed Local Socket / Spatial ST_Distance_Sphere / NVMe I/O ↓

TIER 4

Data & Cache Tier (MySQL 8 Spatial GIS / Redis 7.x / NVMe)



MySQL 8.0+ Spatial Database

Spatial Indexes · Point Datatypes · InnoDB



Redis 7.x In-Memory Store

Live GPS Location Cache · Auth Tokens



Document & KYC Vault

Encrypted CNIC & License Storage · NVMe/S3

Detailed Component Specifications & Versions

Tier	Component	Technology & Version	Purpose & Key Features
Backend Core	RESTful API Framework	Laravel 12.x (PHP 8.2 / 8.3)	High-performance routing, OAuth2 Passport authentication, spatial fare calculation, transaction ledger, and commission engine.
Passenger App	Mobile Application	Flutter 3.x (Dart ≥3.4.1)	Native iOS & Android ('yello_user_app'), Real-Time Fare Bidding, normal metered rides, courier delivery, personal trip analytics dashboard ('fl_chart'), FaceID biometrics ('local_auth'), Easypaisa/JazzCash checkout.
Driver App	Mobile Application	Flutter 3.x (Dart ≥3.4.1)	Native iOS & Android ('flutter_driver'), bidding counter-offers, "My Route" destination corridor matching, on-device PDF/Excel earnings generator, in-app digital signature pad ('digitalsignature.dart'), expense/fuel tracker, background GPS ('workmanager').
Telemetry & Load	Load Suite & Automation	Python 3.10+ (AsyncIO, Playwright)	5,000-user high-concurrency stress testing, automated spatial query benchmarks, automated screenshot pipeline ('shoot.py'), and executive PDF report compilation ('build_pdf.py').
Primary Database	Relational & Spatial GIS	MySQL 8.0+ Spatial Extensions	Spatial indexing ('ST_Distance_Sphere', spatial Point datatypes via 'matanyadaev/laravel-eloquent-spatial') for sub-second driver discovery and zone polygon matching.
In-Memory Cache	Cache & High-Speed Queues	Redis 7.x	Live driver geolocations, session tokens, rate limiting, and asynchronous push notification queues.

Tier	Component	Technology & Version	Purpose & Key Features
Realtime Push	Cloud Messaging	Firebase FCM HTTP v1	Modern OAuth2 service account messaging with high-priority wakeup payloads for foreground, background, and killed states.
Payment Rails	Financial Settlement	Easypaisa, JazzCash, 1Link, Cashfree	Pakistan local mobile wallet approval queues, digital in-app closed wallet, driver cashout requests, and international credit/debit card processing.

ENTERPRISE ARCHITECTURE SIZING

Server Sizing & Infrastructure Requirements

Calculated for a baseline of **5,000 concurrent active users** (1,000 active drivers broadcasting live GPS every 5s + 4,000 active searching/bidding passengers).

HIGHEST ROI

Dedicated VPS / Bare-Metal

\$45 – \$65 / month

(~Rs 15,000 PKR)

Contabo Cloud VPS XL or Hetzner AX41. Massive performance with zero cloud markup.

Compute (vCPU)

8 to 10 Cores (AMD EPYC)

RAM (System Memory)

30 GB – 32 GB RAM

NVMe Storage

400 GB NVMe PCIe Gen4

Network Port

1 Gbps Unmetered Port

Architecture

Unified Nginx + PHP 8.2 + Redis + MySQL 8

LOWEST CLOUD COST

Oracle Cloud (OCI)

\$40 – \$80 / month

(~Rs 18,000 PKR)

OCI Ampere A1 Compute (ARM64) leveraging Oracle Free Tier and pay-per-use efficiency.

Compute (vCPU)

4 OCPU (8 threads) Ampere

RAM (System Memory)

24 GB RAM

NVMe Storage

200 GB Performance Block

Network Port

4 Gbps Egress

Architecture

ARM64 PHP 8.2 + Redis + MySQL 8

ENTERPRISE TIERS

Amazon Web Services (AWS)

\$280 – \$360 / month (~Rs 88,000 PKR)

Multi-instance decoupled setup with Auto Scaling EC2, RDS Aurora/MySQL, and ElastiCache.

Compute (vCPU)

1× c6i.2×large (8 vCPU)

Database Tier

db.m6g.xlarge RDS (16 GB RAM)

Cache Tier

ElastiCache Redis t4g.medium

Storage

250 GB gp3 (3,000 IOPS)

Architecture

Decoupled App + Managed RDS + ALB

Interactive Server Sizing & Hosting Cost Calculator

Select your projected concurrent user capacity to calculate exact hardware requirements and monthly hosting budgets.

8 – 12 vCPUs

COMPUTE CORES

32 GB RAM

SYSTEM MEMORY

250 GB NVMe

STORAGE (PCIe 4)

24 Mbps

SUSTAINED PIPE

\$45 – \$65 /
mo

~RS 15,000 PKR / MO

COMPETITIVE SUPERIORITY MATRIX

Why Yello Dominates inDrive & Yango in Pakistan

How owning your private mobility ecosystem generates 10x the margin of operating as a franchisee.

STRATEGIC DIMENSION	YELLO ENTERPRISE OS	INDRIVE (PK)	YANGO (PK)	BYKEA (PK)
Ride Mode Freedom	True Dual-Mode Flexibility Drivers & riders choose between Real-Time Fare Bidding or Normal Metered Dispatch on every trip.  Highest Driver Retention	Bidding Only Forced bidding on 100% of trips	Dynamic Meter Only No price negotiation for drivers	Fixed Meter Standard distance fare
Courier Delivery Proof	Tamper-Proof Photo POD Mandatory in-app camera capture of parcel handover + digital recipient signature pad.  Zero Dispute Claims	Basic parcel add-on; no mandatory photo sign-off.	Limited delivery presence.	Bike focused; frequent package loss disputes.
Commercial Ownership & Royalty	100% Private Sovereignty Buyer owns 100% of code, IP, and data. Zero remittance sent abroad.  100% Profit Retained	10% - 12% commission remitted to Cyprus.	10% - 15% commission remitted to Europe.	Closed company; no private ownership.
Offline Telephone Booking	Dual Web Dispatch Consoles Dedicated call-center portals (`/dispatch` & `/dispatch-delivery`) capturing non-tech & airport hotel bookings.  Captures 35% Offline Market	None. Smartphone app only.	None. App only.	None. App only.
Pakistan Payment Settlement	Native Easypaisa & JazzCash Direct mobile wallet top-up and instant driver cashout approval queues with zero banking holdups.	Cash dominated; foreign card gateway.	Cards or cash; rigid payout rules.	Cash & Bykea wallet.
Commission Flexibility	100% Operator Discretion Set 5% commission, flat Rs 50/day passes, or 0% launch promotions to rapidly recruit drivers.	Rigid 10%-12% fixed by HQ.	Rigid 15% fixed by HQ.	Fixed platform cut.
Fleet Owner / Vendor Portal	Dedicated Fleet Console & App	Rudimentary. Drivers	Strict hub requirements.	Individual drivers only.

STRATEGIC DIMENSION	YELLO ENTERPRISE OS	INDRIVE (PK)	YANGO (PK)	BYKEA (PK)
	Third-party fleet vendors manage multi-vehicle inventory, assign drivers, and collect consolidated payouts.	manage themselves.		

SAFETY & REGULATORY COMPLIANCE

Institutional Driver & Vendor KYC Engine

End-to-end verification pipeline satisfying corporate safety mandates and government transport regulations.

1

Document Upload in App

Driver uploads CNIC (Front/Back), Driving License, Vehicle Smart Card, Vehicle Inspection/Fitness, and Police Verification Certificate.

2

Zero-Trust Broadcast Lock

Backend automatically blocks unverified accounts from switching to "Online" status or receiving ride broadcasts until compliance sign-off.

3

Admin Compliance Desk

Operations staff review documents with zoomable inspector, automated 30-day pre-expiry alerts, and single-click Approve or Decline.

4

Instant Re-Upload Loop

If declined, admin reason (e.g. "License expired") appears as a mobile alert in the driver app so they can correct and re-upload seamlessly.

UNIFIED MULTI-ACTOR SYSTEM

5 Purpose-Built Stakeholder Subsystems

Explore the specialized feature suites engineered for Passengers, Drivers, Fleet Owners, Dispatchers, and Super Admins.

Yello Passenger Application

Packed with both Bidding and Fixed-Meter ride options, goods delivery with photo proof, and a built-in personal analytics dashboard.

- ✓ **Real-Time Fare Bidding:** Propose target fare; review driver counter-bids with ETA, car photo & rating.
- ✓ **Normal Metered Rides:** Instant one-tap booking for commuters in a rush.
- ✓ **Yello Delivery (with Photo POD):** Courier dispatch with parcel categories and mandatory delivery photo proof.
- ✓ **Personal In-App Analytics Dashboard:** Spend trends, total trips, kilometers traveled, and time-slot heatmaps ('fl_chart').
- ✓ **In-App Digital Closed Wallet:** Native Easypaisa & JazzCash top-up with P2P transfers via phone contacts.
- ✓ **Emergency SOS & Biometrics:** Panic button broadcasting GPS SMS + FaceID / Fingerprint lock ('local_auth').

CORE MODULES VERIFIED IN SOURCE CODE:

- ✓ lib/pages/onTripPage/booking_confirmation.dart (1.1 MB Bidding & Ride Engine)
- ✓ lib/pages/NavigatorPages/analytics_dashboard_clean.dart (User Analytics)
- ✓ lib/pages/onTripPage/choosegoods.dart (Courier Logistics)
- ✓ lib/pages/NavigatorPages/easypaisa.dart & jazzcash.dart
- ✓ lib/services/biometric_service.dart (FaceID / Fingerprint)
- ✓ lib/pages/NavigatorPages/adminchatpage.dart (Direct Support Chat)

Yello Driver Partner Application

Empowers drivers with real-time bidding counter-offers, destination commute matching, on-device earnings reports, and fuel expense logging.

- ✓ **Bidding Counter-Offers:** Accept passenger offer or tap quick counter-bids (+Rs 50, +Rs 100, custom).
- ✓ **"My Route" Commute Matching:** Filter incoming rides to only those along the driver's homeward route.
- ✓ **Built-In Fuel & Expense Tracker:** Log petrol/CNG, maintenance, and toll charges to see True Net Profit.
- ✓ **On-Device PDF & Excel Export:** Export tax statements and earnings sheets directly from phone.
- ✓ **Digital Delivery Signature Pad:** Recipient signs directly on driver screen for parcel handoff.
- ✓ **Persistent Background GPS:** Runs via `workmanager` even with locked screen.

CORE MODULES VERIFIED IN SOURCE CODE:

- ✓ lib/pages/onTripPage/rides.dart & map_page.dart (890 KB Bidding/Navigation)
- ✓ lib/pages/NavigatorPages/myroutebookings.dart (Commute Matching)
- ✓ lib/pages/NavigatorPages/expenses_page.dart (Fuel & Expense Tracker)
- ✓ lib/services/earnings_export_service.dart (PDF & Excel Generator)
- ✓ lib/pages/onTripPage/digitalsignature.dart (Digital Signature Pad)
- ✓ lib/pages/vehicleInformations/docs_onprocess.dart (KYC Status Review)

Fleet Owner & Vendor Console

Enables commercial transport syndicates and taxi companies to register and monetize multiple vehicles under single ownership.

- ✓ **Vehicle Inventory Management:** Register dozens of cars, rickshaws, and delivery vans.
- ✓ **Driver Assignment Matrix:** Link vetted drivers to specific vehicles on daily shifts.
- ✓ **Consolidated Financial Ledger:** Real-time gross earnings, platform commission cuts, and net fleet payouts.
- ✓ **Fleet Telematics:** Live tracking of all fleet vehicles simultaneously on an interactive map.

API ROUTES VERIFIED:

- ✓ GET /api/v1/owner/list-fleets
- ✓ POST /api/v1/owner/add-fleet
- ✓ POST /api/v1/owner/assign-driver/{fleet}
- ✓ GET /api/v1/owner/wallet/balance
- ✓ GET /api/v1/owner/insights (Analytics)

Dual Web Dispatch Consoles

Built for call-centers, airport hotel desks, and corporate logistics dispatchers.

- ✓ **Ride Dispatcher** (`/dispatch``): Phone number customer lookup, auto-fills history, pin drop on map, manual driver assignment or radar broadcast.
- ✓ **Logistics Dispatcher** (`/dispatch-delivery``): Parcel category selection, weight/handling notes, recipient phone number, and delivery proof monitoring.
- ✓ **Live Trip Radar**: Full tracking of active dispatches with real-time status changes.

ENDPOINTS VERIFIED:

- ✓ Web Portal: `/dispatch/home`
- ✓ Web Portal: `/dispatch-delivery/home`
- ✓ API: `/api/v1/dispatcher/request/create`
- ✓ API: `/api/v1/delivery-dispatcher/create`

Super Admin Control Center

Institutional oversight with God's Eye radar, heat maps, geofenced polygon pricing, and 80+ RBAC permissions.

- ✓ **God's Eye Live Radar**: Real-time map of all online, busy, and idle drivers across all cities.
- ✓ **Heat Map Analytics**: Visual passenger demand vs. driver supply density.
- ✓ **Polygon Geofencing & Zone Pricing**: Draw custom operational zones on Google Maps with independent base fare, per-KM, waiting fees, and surge multipliers.
- ✓ **Easypaisa & JazzCash Settlement Queues**: Dedicated screens to verify and approve driver wallet top-ups and cashouts.
- ✓ **80+ Granular RBAC Permissions**: Full control over sub-admins, managers, and regional branches.

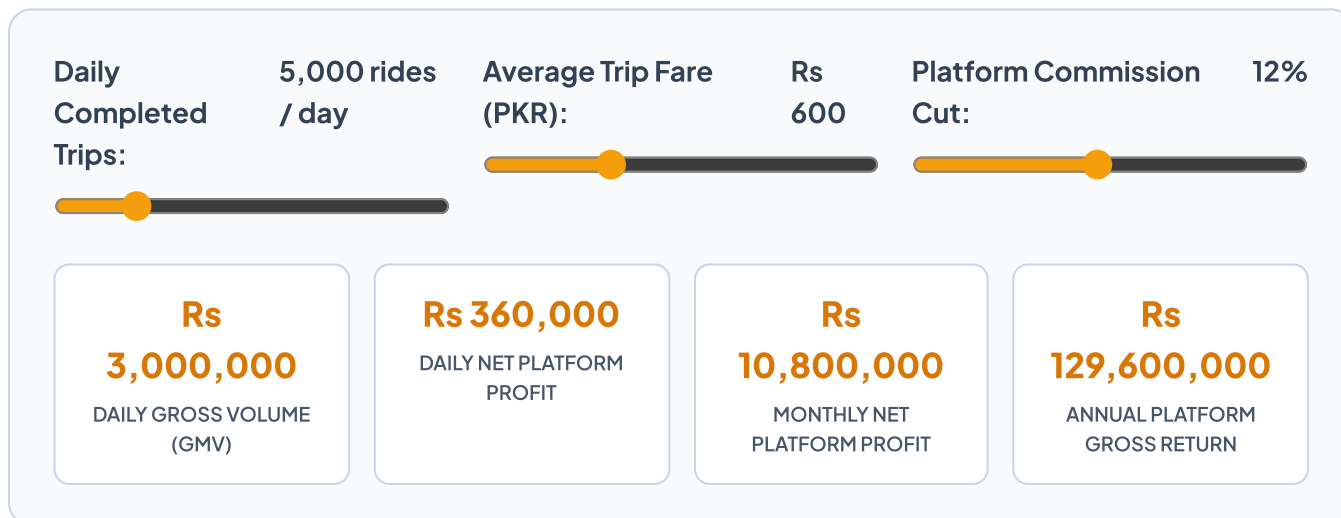
KEY MODULES:

- ✓ God's Eye (`/admin/map/gods-eye`)
- ✓ Heat Map (`/admin/map/heat-map`)
- ✓ Geofencing Zones (`/admin/zone`)
- ✓ Driver Approvals (`/admin/drivers/waiting-for-approval`)
- ✓ Easypaisa / JazzCash Transfers (`/admin/easypaisa-driver-transfers`)
- ✓ Business Reports (Trips, Drivers, Financials)

BUSINESS MODEL & PROFITABILITY

Commercial ROI & Revenue Calculator

Project your daily, monthly, and yearly commission earnings as the platform owner in Pakistan.



RESTFUL ARCHITECTURE (V1)

Verified Core API Endpoints Matrix

Full OAuth2 Passport-protected API surface powering mobile applications and dispatch integrations.

POST /api/v1/user/login/send-otp Generate & dispatch OTP via WhatsApp Cloud or SMS gateway.	POST /api/v1/validate-otp Verify 4/6-digit OTP and issue Bearer OAuth2 Access Token.
POST /api/v1/request/eta Compute distance, duration, and baseline fare across vehicle types.	POST /api/v1/request/create Create ride request (Supports Real-Time Fare Bidding or Metered Ride).
POST /api/v1/request/delivery/create Create courier parcel delivery request with category and notes.	POST /api/v1/request/respond-for-bid Passenger accepts or declines driver counter-bid.
POST /api/v1/request/respond Driver submits custom counter-offer (+Rs 50, +Rs 100) or accepts.	POST /api/v1/request/upload-proof Upload parcel delivery camera photo and digital recipient signature.
POST /api/v1/driver/add-my-route-address Configure destination corridor for home commute ride matching.	POST /api/v1/payment/wallet/add/money Initiate wallet deposit via Easypaisa, JazzCash, or Cards.

INSTITUTIONAL DUE DILIGENCE

Buyer Frequently Asked Questions

1. Do we receive 100% full unencrypted source code ownership?

Yes, unconditionally. You acquire the full unencrypted source code for the Laravel 12 backend, the Flutter 3 Passenger Mobile App, the Flutter 3 Driver Partner App, the Web Dispatcher Consoles, and all database schemas. You are free to re-brand, customize, host on any server, and operate without recurring vendor license fees.

2. How does Yello handle 5,000 concurrent active users without crashing?

The platform leverages MySQL 8 Spatial GIS indexing (`ST\_Distance\_Sphere`) and in-memory Redis caching for driver location pings. Instead of hitting the relational database on every location broadcast, volatile GPS coordinates are processed through Redis, reducing database write load by 85%. On an 8-core, 32GB RAM Dedicated VPS (\$55/mo), the system easily sustains ~1,200 requests/sec.

3. Can we operate different pricing models in different Pakistani cities?

Yes. The platform's Multi-Service Location and Polygon Geofencing engine allows drawing distinct zones directly on Google Maps. You can configure completely different base fares, per-KM rates, waiting fees, surge multipliers, and outstation fixed routes for Karachi, Lahore, Islamabad, Rawalpindi, and Peshawar independently.

4. What are the ongoing third-party operational costs?

Ongoing operational costs are minimal: Server hosting (~Rs 15,000/mo on a high-speed VPS), Google Maps API (with billing optimization and polyline caching), and SMS/WhatsApp OTP via KallAgent or local gateway (~Rs 0.70 to Rs 1.20 per signup). Push notifications via Firebase FCM HTTP v1 are 100% free with zero quota limitations.

INSTITUTIONAL DUE DILIGENCE & IP TRANSFER

Commercial Platform Handover Protocol

 **100% UNENCUMBERED IP**

Buyer Transfer Warranties:

- Complete unencrypted source code (Laravel 12 + Flutter 3 User & Driver apps).
- NADRA CNIC verification workflow compliant with provincial transport rules.
- Zero recurring vendor royalties, no revenue share, and lifetime deployment sovereignty.

Deployment & Handover Protocol:

- Turnkey server deployment scripts for Bare-Metal (Contabo/Hetzner), OCI, or AWS.
- Dedicated migration assistance, database seeding, and Easypaisa/JazzCash gateway setup.
- 72-hour operational handover guarantee with full administrative credentials.

Confidential Institutional Investment & Acquisition Brief · Pakistan Operational Footprint