### **Parkping – Smart Contact System for Parked Vehicles**

**Overview:**

**Parkping** is an innovative platform designed to bridge the communication gap between vehicle drivers and the public in real-world parking scenarios. It allows anyone to securely and instantly contact the current driver of a parked vehicle using strategically placed **QR codes and NFC tags**.

Each vehicle is equipped with two unique tags:

1. **QR‑Out / NFC‑Out** (facing outside):  
   * When scanned or tapped by a passerby, this tag reveals the current driver's contact information.
   * If the driver cannot be reached after three failed contact attempts (e.g., “Couldn’t reach driver” clicks), the system intelligently escalates and displays the **vehicle owner's contact details** instead.
2. **QR‑In / NFC‑In** (facing inside):  
   * This tag is used by drivers to **log in or register** using their name and phone number.
   * Drivers can create:  
     + A permanent **Owner profile** (once per vehicle)
     + **Frequent driver profiles** (e.g., family, colleagues)
     + **One-time/temporary drivers** (e.g., valet, friend, delivery)
   * Owners can manage all profiles and assign the current driver.

**Key Features:**

* 🔒 **Secure Profile System** – Role-based access (Owner/Admin, Driver).
* 🧠 **Smart Fallback Logic** – Shows owner contact after 3 failed attempts.
* 🚀 **Seamless Scanning UX** – No app download required.
* 🧾 **Logging & Rate Limiting** – Tracks scans and protects against misuse.
* 🖨️ **QR Code Generator** – Creates unique vehicle tags.
* 📲 **NFC Integration** – Allows tap-based profile and tag activation.

**Tech Stack:**

* **Frontend**: React + TypeScript
* **Backend**: Node.js (Express) or Python (FastAPI)
* **Database**: PostgreSQL
* **Authentication**: JWT-based
* **QR/NFC Support**: QR code image generator & NFC UID encoding instructions

**Use Cases:**

* Public parking situations
* Apartment complexes or gated societies
* Corporate or shared fleet vehicles
* Valet or event parking

**Vision:** Parkping aims to make cities more civil, connected, and responsive by creating a communication layer over urban vehicle parking.



