

# New Pay-by-Cell methods for On-Street and Off-Street parking

## Transparent Wireless Systems, LLC (TWS)



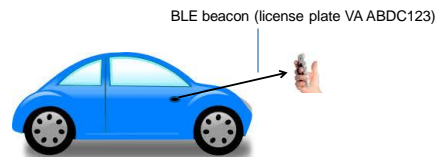
www.transparentwireless.com

### Our Value Propositions

**Substantially better user experience is required for mainstream adoption of Pay-by-Cell.** We have leveraged our experience in wireless technologies [Bluetooth Low Energy (BLE) and GPS] to make Pay-by-Cell much easier for the end user for both on-street and off-street parking. We have also introduced many new benefits for city authorities and garage owners. Demos available on request.

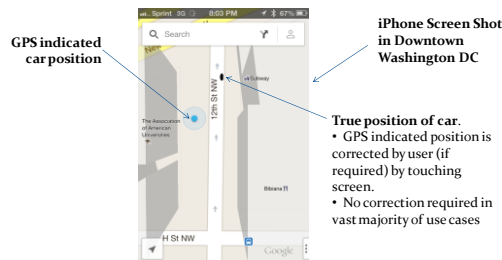
### Innovations for On-Street Parking

1. **Automatic vehicle identification:** The phone knows which car it is in by means of an in-car BLE beacon. No manual data entry required.



2. **Automatic determination of parked location, based on GPS (user corrected if necessary):** We have **done away with zone IDs** (a burden for both the parking service provider and the City) by using GPS to automatically identify the car's parked location. New streets/cities can be opened up for Pay-by-Cell without having to add zone IDs to already cluttered on-street signage. The user does not need to find his zone ID and enter it manually on his phone. Urban canyon induced GPS errors, if any, can be corrected by the user on a map displayed on his phone.

### Autonomous Position Sensing



### No need for zone IDs



On-street signage required by a legacy system  
Being GPS based, TWS does not require on-street signage for zone IDs.

3. **Substantial lightening of enforcement burden:** Our system maintains **knowledge of the locations of our subscribers' vehicles and their session status (expired/unexpired)**. We could share this with the Enforcement Officer (EO) to substantially reduce his workload (we will do this *only* if we can negotiate a benefit for our subscribers, such as limited fine reduction). Most legacy systems cannot tell if their subscribers have overstayed. We allow our subscribers every opportunity to avoid fines by innovative methods such as **automatic session renewal**, subject to mandatory limits. Our enforcement plan is a **win-win deal for both the City and the end user**.

Enforcement Officer's Terminal Screens



Enforcement Officer visits red icons and confirms their ID using wireless validation (Bluetooth Low Energy)

Visit our website for more product details. Covered by pending patents.

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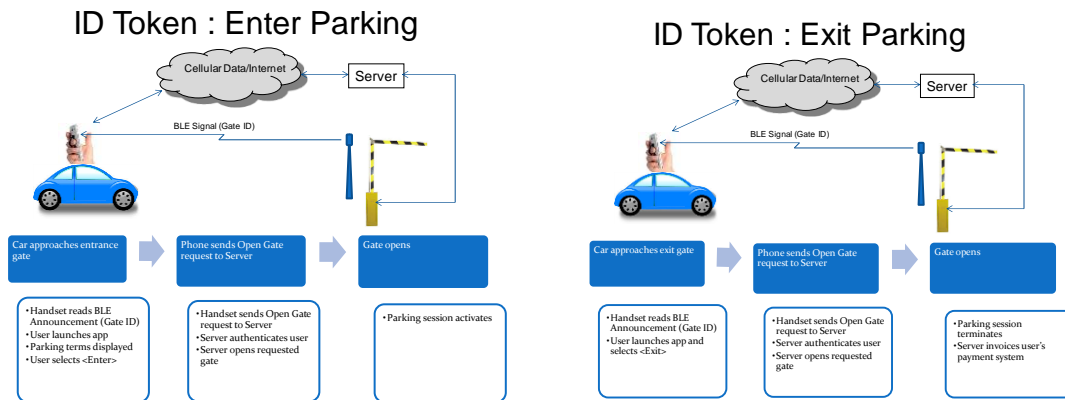


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### Innovations for Off-Street (Gated Garage) Parking

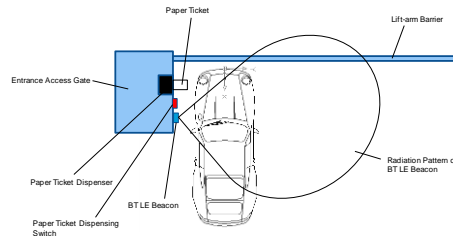
We have two Pay-by-Cell systems, customized to existing garage infrastructures using either ID tokens or paper tickets. We also offer means for the garage owner to broadcast real time bulletin board information to prospective users (e.g. occupancy levels and dynamic rates).

1. **ID Token Substitution:** Substitute ID tokens with a TWS smartphone app. Only 2 screen touches required to authenticate user to garage server and open entrance/exit gates. **User experience is similar to opening home garage door with a remote.** No rewiring of garage, as required for RFID; no winding down window, as required for NFC or optical scanning of a posted code at the gate.



2. **Pay-by-Cell for Paper Ticket Systems:** An extremely facile system that requires the user to do nothing more than launching our Garage Parking app before entering. Thereafter, **user's experience is identical to that in existing systems, except that he does not have to queue/pay at a kiosk or a manual gate.** The garage infrastructure automatically recognizes the ID of his ticket by means of BLE and our patent pending methods. Our TWS system also **recovers lost tickets**, allowing the user to pay for actual session time without the physical ticket.

## Pay-by-Cell for Paper Tickets



- Phone remembers time when BLE signal is maximum.
- This time is the user's estimated time of ticket issuance

#### Problems solved

- Payment at kiosk or manual gate
- Lost ticket recovered

#### Solution

- Automatically identify ticket by *time of issuance* using BLE and smartphone

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