



RFID based Vehicle Tracking & Parking Lot Management System

WHITE PAPER

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The present day metropolitan areas have seen a burgeoning growth in human population as well as vehicles. With shrinking spaces, operating a managed, **busy & expensive parking lot having multiple gates** can pose significant challenges, especially to a **government organization** that also owns some of the vehicles in the lot. The parking area has to be secure, with barrier-enforced entrances and exits. It also has to have an **automated, efficient monitoring system** that allows for accurate vehicle tracking as well as easy in-and-out access for drivers.

Tracking offers benefits to both **private and public sector individuals**, allowing for **real-time visibility of vehicles** and the ability to receive advanced **information regarding legal existence and security status**.

With this RFID vehicle tracking system, vehicle information can be automated gathered to enable vehicle management to be more **efficient and safe**. With RFID vehicle tracking system with **high identification accuracy**, parking areas or gated communities can manage their vehicles efficiently **without human intervention as well as easy in-and-out access for drivers** and **with low deployment and operation cost**. RFID's also offers a turnkey solution for parking operators that require the ability to monitor and record not only access and exit to parking facilities but also **log and bill back parking charges by customer**.

Negative impacts on Vehicle tracking & parking management system

- Controlling traffic movements on an airport, restricting vehicles to urban areas, vehicle access to gated & secured areas is difficult.
- Accurately identify and authorize vehicle movement i.e. Permit slip is not identified with the vehicle's Identity.
- Collect and record vehicle movement data i.e. **Manual entry leads to higher possibility of human error**.
- Complexity in security within the parking facility.
- Difficulty in **Managing staff for peak traffic periods**.
- Hard to identify the driver of the vehicle i.e. **driver authentication**.
- Not easy to **relieve congestion**.
- **Expensive & busy parking lot** having multiple gates.
- **No time to wait in Queue for payment. Unsatisfied customer service.**

Hoboken RFID-enables Its Parking Permits

Armed with handheld RFID interrogators, the city's parking-enforcement officers can spot scofflaws in just a few seconds.

-- *RFID Journal, June 12, 2006*

RFID based Vehicle Tracking & Parking Management System

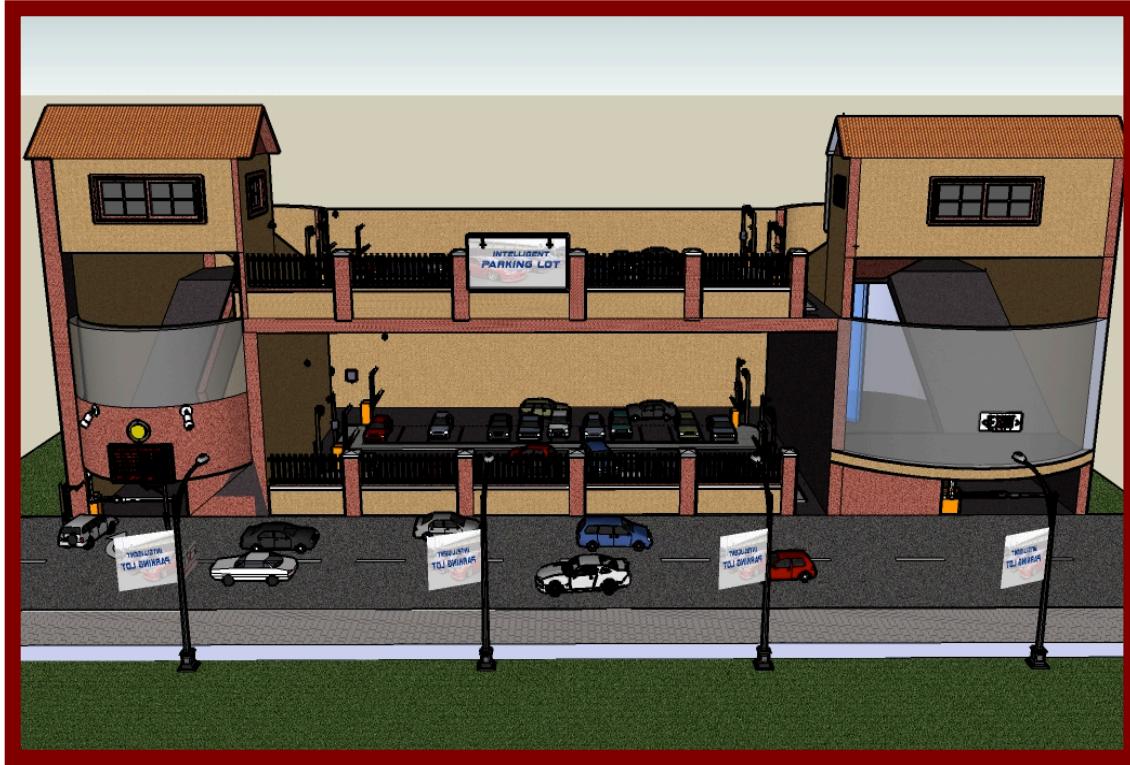
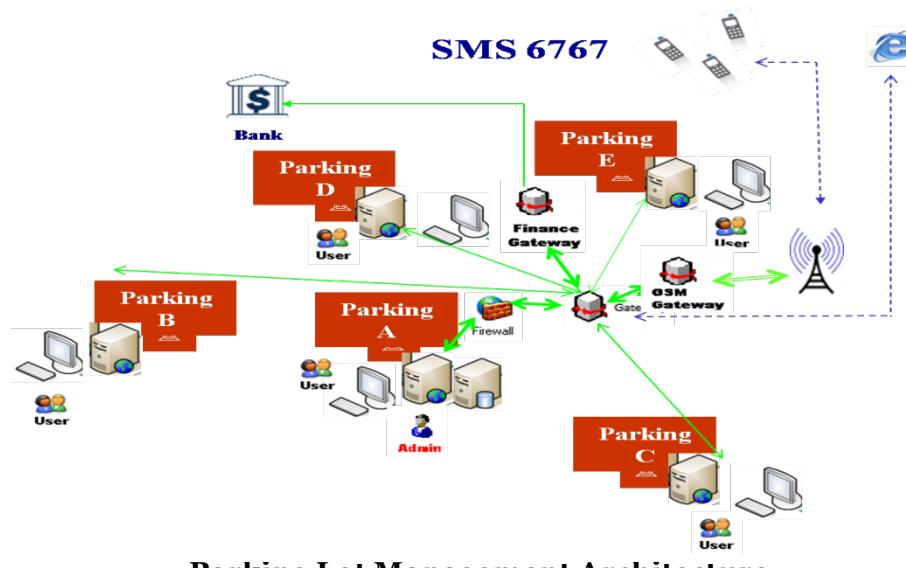


Figure 1: Parking Lot Vehicle Management System

Above figure describes the parking lot vehicle management system which is composed of RFID tags (for the vehicles), readers stationed around entry and exit points, applications software that can be customized as per specific needs.



Workflow

- ❖ By making use of the write capability of the RFID readers, **Windshield RFID tag** is embedded with unique identification code and is assigned to the vehicle.
- ❖ The tag contains distinct information about the vehicle, like vehicle color, license data, model, Year and parking place or any other distinct data.



Figure: 2

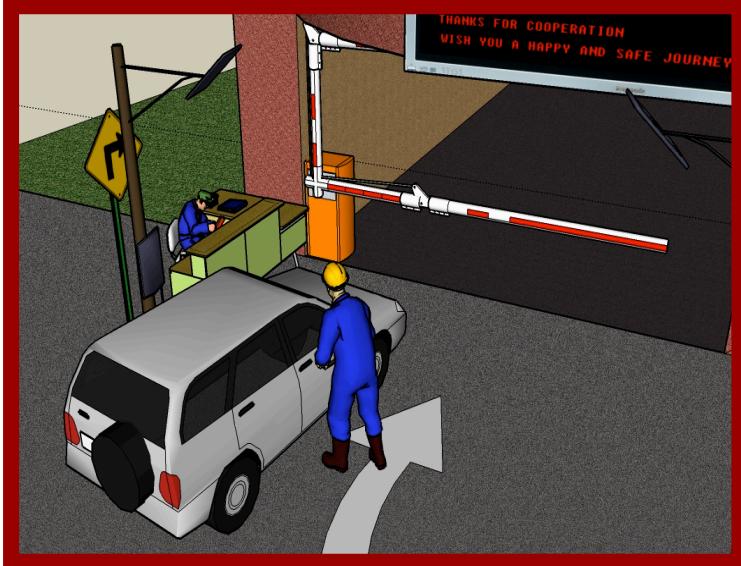


Figure: 3

- ❖ A prepaid account can be linked to the vehicle RFID tag. RFID tags are affixed to automobiles.
- ❖ The RFID reader authorizes the vehicle for entry, logs entry time, and transmits that data back to the server in the control center & compared with the database, then the gate mechanism is activated and the vehicle enters as shown in **Figure 2 & 3**. In case of any discrepancies in the data compared

Finnish Parking Pilot Taps RFID Tags and NFC Phones

The system enables the city of Oulu to chronicle how long a car is parked, sends reminders to the driver and automatically deducts payment from a designated account.

-- *RFID Journal, Sept. 7, 2007*

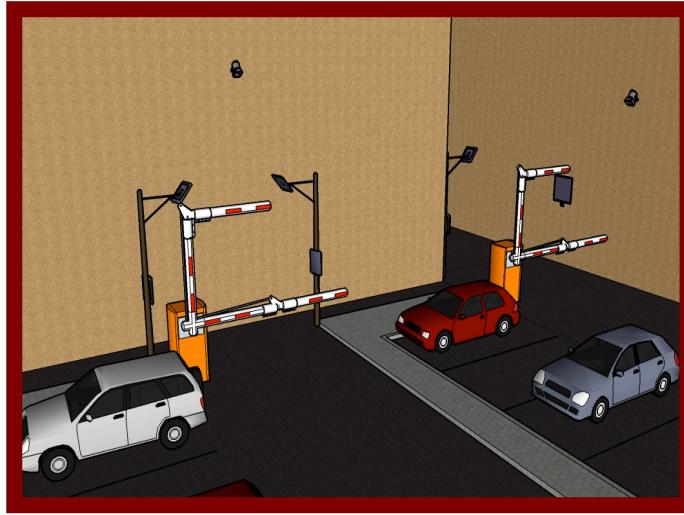


Figure: 4

- ❖ A similar exit point is configured, and when the vehicle leaves the RFID reader logs exit time, releases the gate mechanism, and transmits the exit data back to the server.
- ❖ The Customer's account is then debited for the time she/he spent in the parking lot or charges the parking services against a credit card.

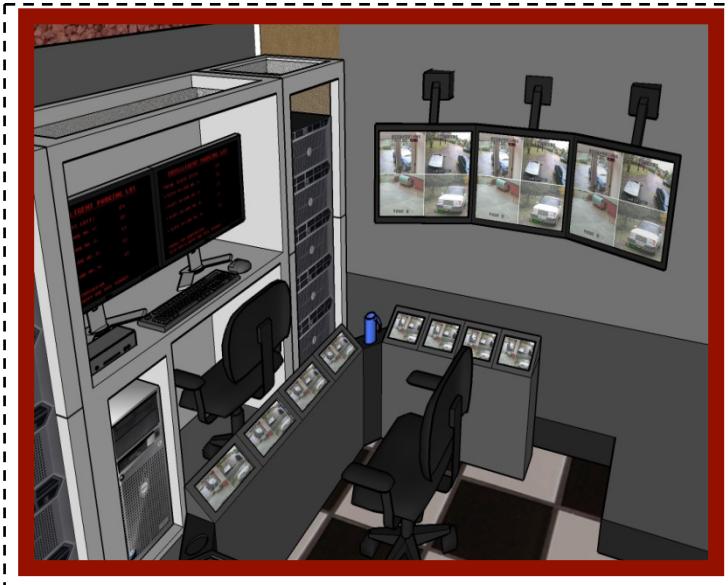


Figure: 5

“Collecting data with RFID and without human intervention will change many business sectors. Classic methods of parking and vehicle tracking operations will be history in the near future.”

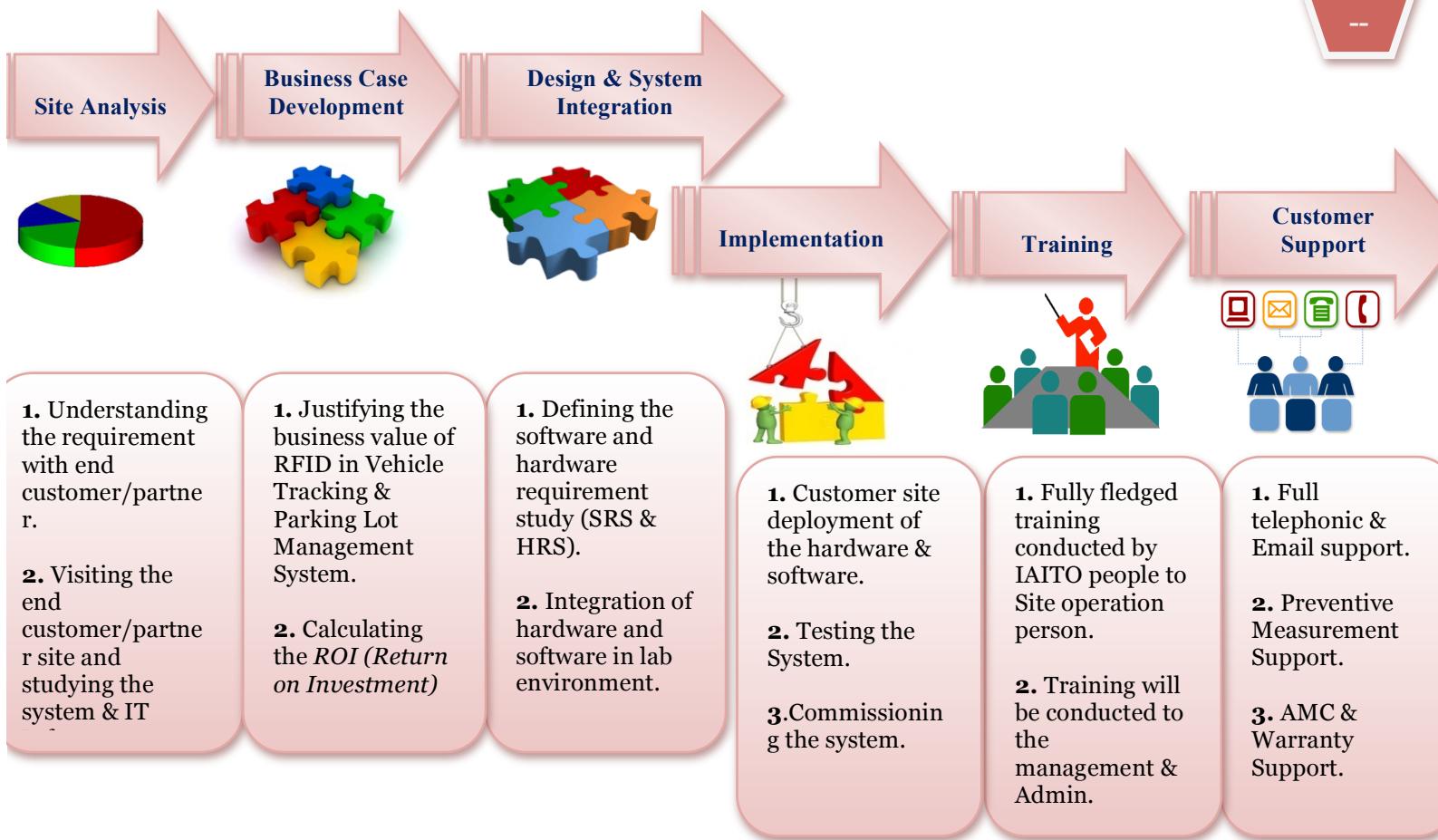
-- Levent Yalcinkaya, STS Technology, Technopark Director



Benefits of RFID in Vehicle Tracking & Parking Lot Management System

- Automatic hands free access control into and out of parking lot increases customer safety and security.
- Automatic & fast processing of parking fees based on different category and/or level of users.
- With automatic vehicle identification can dramatically increase security and prevent loss of luxury vehicles. Initiates an alarm when a car "disappears" from inventory.
- Elimination of staffing at entry and exit points.
- Cost effective to locate a PC at each entry point where an RFID reader and the gate control mechanism are located.
- System is flexible to allow a human interference, if necessary, to be able to accommodate unusual events such as when the non-tagged vehicles enter.
- Gives automatic notification when a car enters or leaves the lot.
- Eliminates manual record keeping, thereby increasing accuracy and staff productivity.
- Helps to locate vehicle quickly for Efficiency i.e. Level wise vehicle counting.
- Real time parking status updates.
- Helps to manage defined space parking.
- Improved service levels and increases capacity in the parking lot.
- Real time parking guidance display-display boards displays the number of empty slots at every level.

What IAITO can Provide



Why you should select IAITO Infotech as your partner

- We understand the RFID Technology, Solution and have knowledge of the Industry with the top Notch IIT Kanpur R&D engineers who are having more than 5+ years experience in the same domain.
- Our understanding about the RFID Business Values & ROI Realization is with 15+ years experience business people in team.
- We provide High Quality Product & Testing process (*ISO 9001: 2008 Certified Company*).
- We Have High Techno Commercial viability – ROI.
- Indigenous Setup (Design, Developed & Tested in world class RFID lab of IIT Kanpur).
- We have Local Support & Strong Partner Network Framework to ensure better support.

Conclusion

RFID technology provides independent, non-stop systems for security, parking, and access control. This technology provides businesses and communities with hands-free control to ensure only authorized vehicles have entry. RFID park lot management system is one of the few real-time locating systems that provide fast return of investment (ROI). System helped user reduce the wasting time of search parking lot and also improve the parking lot utilization.

About **IAITO INFOTECH PVT LTD (ISO 9001:2008 certified)** an incubate company of IIT Kanpur provides state of the art integrated traceability, identification and authentication solution. It provides software as well as integrated turnkey solution of both(hardware, software & services) in various technologies like RFID, NFC, GPS, Mobile technologies etc.

With the knowledge of experienced professional, we are able to help you to deploy right combination of technology that will maximize your ROI right from start and ensure its expandability as the application grow through the evolution of the technology.

With our R & D experienced team, we have developed different integrated solutions for various industries and carry one of the most comprehensive product/solutions.

IAITO's turnkey solutions model covers industries like Aviation, Manufacturing, Transportation, Retail, Government, Renewable Energy, BFSI and Mining.

For more Information kindly visit our website <http://www.aito.co.in/>

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