

# Permitless Parking

Submitted by:

Kyle Tanabe  
Adjudication Unit Manager  
Parking & Transportation Services  
200 Public Services Building  
Irvine, CA 92697  
[ktanabe@uci.edu](mailto:ktanabe@uci.edu) / (949) 824-5059

Project Leaders: Ron Fleming, Clint Maruki, Kyle Tanabe  
Team Members: Michelle Arcilla, Desiree Fleming, Jeff White

## **Project Summary**

In Fall of 2007, Vista Del Campo and Vista Del Campo Norte became the first housing units at UCI to utilize Parking & Transportation's new web based Parking Management System which utilizes License Plate Recognition (LPR) technology. This new Parking Management System eliminates the need for paper permits (2500) thereby reducing staff time, inventory systems, and issues surrounding lost or forgotten permits -- unwarranted citations are also reduced when compared to traditional parking systems. Users manage accounts through the web based system to designate the time and date that they want to park their vehicle. The web based system simplifies the previous 18 step parking management/enforcement process to just 3 steps.

## **Project Description**

Parking & Transportation Services introduced virtualized parking permits to the University of California, Irvine campus in September, 2007. Virtualizing parking permits is the process of using an existing identifier on the vehicle to serve as the vehicle's parking permit. Researching technology used in Europe and the toll roads in California, Parking & Transportation found that the license plates of the vehicle met this criterion. Vista Del Campo and Vista Del Campo Norte Housing complexes were the first to test the system. They were selected because they are considered a third party housing area and the parking permits that are issued for the complexes are not valid in campus parking lots. Parking's Information and Technology group created a web based application (VDC Parking Management System) that allowed the residents of the housing complexes to manage their parking options through unique accounts. The residents are able to manage their own account and can register and delete vehicle(s) without having to burden Housing staff to make the changes. In addition, all changes are done in real time through the Parking Management System. Housing administrative staff retains the authority to manage resident accounts. Real time data of parking lot utilization is available to Housing management which aide them in granting or denying parking permissions to residents and visitors by activating or deactivating the accounts. Persons that do not have an active account do not have the ability to park in the complex's parking facility. Enforcement of parking facilities is simplified with real time data provided by the web based PMS when used in conjunction with License Plate Recognition (LPR) technology. LPR is comprised of a camera and laptop computer that uses software to interpret or read images of license plates that then verifies the read image against a list of authorized plates from the Parking Management System. If the license plate is not found on the list, the vehicle is then issued a parking citation for not having permission to park.

The virtualization of parking permits has taken a very labor intensive paper system that once encompassed 13 steps and created a two step paper-less process. Previously, residents of Vista Del Campo and Vista Del Campo Norte registered their vehicles directly through their respective housing office. The residents had to complete a paper application which included signing an agreement of terms that were outlined by Housing and noting their license plate number on the paper form. Housing staff would then data enter the license plate from the application into an electronic spreadsheet and manually

send updates to Parking on a daily basis. In addition to requiring Housing to be responsible for sending the list of parking updates on a daily basis, Housing also had the difficult task of interrupting the sometimes illegible handwriting of the resident. Moreover, Housing understandably made errors while transferring thousands of vehicles from their paper forms to the electronic database. These errors resulted in Parking ultimately issuing and then cancelling unwarranted parking citations which subsequently put undue stress on Parking, Housing, and the resident who received the parking citation. Additionally, because the list of updated parking registrants was sent to parking on a daily basis, residents who wished to change or update their vehicle information after 5pm had to either wait until the next business day to park or they could park and risk receiving a parking citation.

Historically, VDC utilized Parking & Transportation's services to enforce and patrol their parking lots. VDC was responsible for distributing parking permits and creating parking regulations; Parking was responsible for enforcing these regulations pursuant to VDC's policies. Even though VDC and Parking worked together to manage parking, the responsibility of parking regulations and permissions were controlled by VDC and enforcement and citation related issues were handled by Parking. However, because users previously registered their vehicles in the VDC Housing office, the recipients of parking citations often did not know whether to contest the ticket through VDC Housing or through Parking & Transportation. This confusion put VDC in a precarious situation because they had no legal authority to waive or uphold the parking citations. VDC was stuck in the position of being the intermediary, and they utilized hundreds of hours of staff time working on parking citation related issues. A major benefit gained by the virtualization of the parking permit was that the VDC Parking Management System eliminated VDC's association with parking enforcement and citations. Since the implementation of the system in Fall, 2007, Parking noticed that the recipients of parking citations are correctly contesting their citations through Parking & Transportation. Parking estimates that complaints to VDC in regards to parking citations have been reduced by more than 75 percent.

## **Technology**

The Parking Management System (<http://www.parking.uci.edu/vdc>) is the web based application that is used by all users to manage parking. The PMS introduces user-driven autonomy to the existing parking registration system while still affording VDC staff full control over parking space distribution and parking authorization. This system granted users the freedom and flexibility to manage their parking permissions from any computer with an internet connection. However, the new management system puts the responsibility of accurately submitting vehicle license plate information solely on the user. Moreover, VDC administrators still retain control over the users who were granted access to this system, how often the users were authorized to update their vehicle information, and they were able to monitor the number of times that a user changes vehicles. Administrators can modify both global and individual user settings at their

discretion. They are able to control the number of times a user can change their vehicle, restrict certain users or groups from changing their vehicles, and they can suspend or grant parking privileges all from the PMS. VDC administrators are also given the ability to appoint lower-level staff as dashboard users; these staff users can track vehicle registration histories in order to assist the general parking users. Previously, users submitted vehicle changes on paper forms, and they initialed and signed the paper form to indicate that they agree to VDC's parking terms and rules. The PMS requires that all users electronically agree to VDC's parking terms before logging into the system for the first time. Furthermore, each user will also electronically agree before making any type of vehicle change. This feature eliminated over 3500 paper forms that VDC and VDC Norte had to store and file.

In September of 2007, eligible VDC users were each sent an automated email from Parking that contained their username (email address) and a temporary password. When the users logged into their account, they were required to read and electronically agree to VDC's parking terms and policies. Once they agreed, the residents were given the option to change their password and register their first vehicle. Users no longer were restricted to registering their vehicle before 5pm, as all registration submittals went into effect in real time. Users can now update their vehicles from campus, home, coffee shops, or even from their cell phones. Each time a user registers a vehicle, the registration is time stamped (date and time), and a historical record is kept for all vehicle registrations for each user. Individual users have access to their own vehicle registration history and VDC appointed staff as well as Parking staff have access to all general user vehicle registration histories as well. The vehicle registration history helped Parking conduct citation reviews as VDC's policies dictate that vehicles must be registered prior to parking. Verifying the exact minute that the vehicle was registered enables Parking's Adjudication unit to render fair and precise review dispositions. Moreover, VDC is able to use the vehicle registration history to determine how many times their users change their vehicles. This feature will help them determine who is unlawfully sharing their parking privileges with friends and VDC will also be able to investigate users who may be possibly trying to cheat the system.

License plate recognition technology (<http://www.pipstechnology.com/> / [http://www.parking.uci.edu/parking/PublicInfo/LPR\\_banner.pdf](http://www.parking.uci.edu/parking/PublicInfo/LPR_banner.pdf) ) begins with the capturing of the vehicle's license plate using an infrared video camera. The image captured by the video camera is transferred to a laptop computer where recognition software translates the alphanumeric content of the license plate. The translated image is then checked against a database of permitted vehicles and an audible and visual alert notifies the enforcement officer if the vehicle is in violation. The process of recognizing the license plate and checking it against the database is completed in a matter of seconds. Previously, enforcement officers were required to check the vehicle thoroughly in search for a parking permit. It is not unusual for traditional permits to not be properly displayed; they are often covered by other parking permits, displayed facedown, or covered by sunshades. These efforts to find and verify the validity of traditional parking permits could take upwards of 3-5 minutes per vehicle. These obstacles make traditional lot patrols inefficient and cumbersome. License plate recognition has proved to be over 90%

accurate at interrupting license plates and the overall use of LPR has greatly improved efficiently.

## **Implementation**

The implementation process began in March, 2007. Parking's goals in creating this system were to allow users easier access to manage their parking permissions, remove Housing as an intermediary, alleviate workload for Housing staff, and to create a system that can be used in conjunction with LPR. Development was brainstormed during the Spring of 2007 by Parking & Transportation staff. Screenshots of the system were developed and shared with VDC. VDC administrators gave input and both Parking and VDC worked on ways to successfully implement the system. It was agreed that the best time to implement the system was Fall of 2007 as new residents were scheduled to move in. Residents were given a 2 week grace period to acclimate to the new system and to register their vehicles. VDC provided a list of residents who were given permission to park in their lots. The list of residents included an email address, and Parking sent out an email to each resident with their account information (username / password). Email registrations covered the majority of the users, but in some cases, VDC granted parking privileges to users after the sending of the initial mass email. For these situations, VDC had the ability create a user account and send the individual an email with their login information from the PMS. After the grace period of allowing users to register their vehicle, Parking began to enforce the lots with a mobile LPR system. Parking citations were issued to vehicles that were not registered in the database. The entire implementation process took about 6 months from the beginning of development to production level use of the PMS and the mobile LPR system.

## **Customer Satisfaction**

Overall, contact between Housing and residents regarding parking enforcement issues have decreased because the responsibility of parking management has shifted from Housing to the resident. VDC has conveyed that parking related complaints have declined since the implementation of the PMS. VDC staff time that was once devoted to data entering license plates is no longer required. Issues of trying to interpret user handwriting have been eliminated and there is no longer ambiguity to whether the user mis-wrote their license plate or a VDC staff member incorrectly translated the license plate. For the FY0607 year, Parking cancelled 829 citations issued for "No Valid Permit Displayed." These citations were cancelled because vehicle operators forgot to display a parking permit, VDC Housing error, or due to ambiguity of the prior license plate registration system. Since the implementation of the Parking Management System in Fall, 2007, only 351 citations issued for "No Valid Permit Displayed" have been cancelled. Additionally, because the PMS is the only platform for vehicle registration, VDC Housing is no longer seen as an intermediary for parking. Parking has observed that the recipients of parking citations are correctly appealing through Parking & Transportation. The Parking Management System has ensured that the State mandated citation review process is followed. Per Parking's estimation, citation related complaints to VDC

Housing have decreased by over 75%. VDC Housing is pleased that Parking has provided an application that simplified the previous 18 step parking management/enforcement process to just 3 steps.