Tel Aviv Municipal Corporation – Smart City Wide Parking Management for the Benefit of Urban Residents

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Abstract

Tel Aviv, as most major cities, suffers from a lack of parking spaces, both residential and commercial, for its residents as well as those who commute to work in the city each day. This situation has caused much annoyance to all and had become a major municipal issue.

Ahuzat Hachof is a Tel Aviv Government Corporation managing the entire Tel Aviv municipal parking infrastructure and activities in the 110 city parking lots under its jurisdiction, which faced a number of major challenges including;

➢ Auditing and control of municipal parking revenues from one central location

➢ Solutions for the many residents of Tel Aviv for parking subscriptions and discounts in their area of residence

➢ Increasing the number of automated parking lots in order to decrease human resources required, and increase revenue.

The solution was a smart combination of VRS (Vehicle Recognition Systems) systems in an automatic parking system, where the discount option for payment by Tel Aviv Residents is based on the VRS input of approx. 300,000 residents in the municipal system data base. A feature for special events, concerts and sporting events was also included whereby after payment on POF (pay on foot) machines, the transaction closes via the license plates while exiting the parking, with no need to insert the ticket at the exit.

As a result of this new system, income from parking in the automated lots has increased by 30%, and Tel Aviv residents have reported a higher level of satisfaction with service.

Background

Tel Aviv, as most major cities, suffers from a lack of parking spaces, both residential and commercial, for its residents as well as those who commute to work in the city each day. This situation has caused much annoyance to all and had become a major municipal issue. As in many urban centers, it was due to a lack of physical space in the city, primarily apartment dwellings with little to no parking on premises, a high ratio of vehicles to residents, commercial enterprises in residential neighborhoods and a lack of broad based public transportation. This resulted in increased traffic jams as residents searched for free parking, and created political backlash as residents were increasingly fined and towed for unsafe or illegal parking.

The city of Tel Aviv recognized the need for a solution which would reduce inner-city traffic, increase access to parking, as well as the rights of residents to safe and affordable parking. This comprehensive solution began with registering residents in a municipal database and being issued on-street parking stickers. These stickers allow residents free "on-street" parking in their zones of residence, and half price parking in all Municipal parking lots anywhere in the city. The next step, however, transformed the parking experience for all resident and non-resident drivers. It provides a comprehensive overview of parking availability at all major city centers and expedites parking entry and exit via VRS-enabled pay-systems.

Tel Aviv operates 110 city wide parking lots via a Tel Aviv Government Corporation called Ahuzat Hahahof. These lots vary in size from 50 to 2,000 parking spaces and are located throughout the city. Historically, all lots were staffed by attendants during the day and evening, although during the night shift of midnight to 7:00 AM the lots were left unattended due to a lack of desire to pay the overtime shift fees required for these hours. An inability to properly audit and manage the parking infrastructure, due to staffing requirements and income "leakage" caused a loss of income to the city and a perceived lack of service to the Tel Aviv residents.

The major challenges faced in administering parking in Tel Aviv to the resident population of the city were as follows:

> ➢ Auditing and control of municipal parking revenues from one central location

> ➢ Service – Centralized solution for the many residents of Tel Aviv for easy and accurate parking subscriptions and discounts in their area of residence

> ➢ Increasing the number of automated parking lots in order to decrease human resources required and increase revenue

➢ Decrease vandalism in the parking lots

➢ Increase level of service to Tel Aviv residents

A revolutionary new solution to the challenges posed:

➢ Integration and synchronization of the Municipal Data base

➢ Smart combination of VRS (Vehicle Recognition Systems) systems in automatic parking systems

➢ Discounted payment for Tel Aviv Residents based on the VRS input (Tel-Aviv residents in the municipal system data base) is automatically calculated at the point of payment by the back office software.

➢ Over night free parking according to allocation of residents to specific parking zone in the city. The rights are calculated by the license plate. If a Tel Aviv resident parks in a municipal parking lot in his/her own zone of residence, there is no charge.

➢ On-street electronic signs post parking spot availability at lots in each neighborhood zone, enabling drivers to quickly decide where to look for parking, saving driver's time, reducing traffic and fuel emissions.

➢ New feature; After payment on POF (pay on foot) machines, the transaction closes via the license plates (which serves as the ID from start to finish of the entire transaction) while exiting the parking, with no need to insert the ticket at the exit.

  ➢ This is a great expediter of vehicle bottlenecks at special events, concerts and sporting events as it saves approximately 1 minute per car, as the car does not have to stop and insert the ticket into the machine at the exit lane.

  ➢ This feature also cuts fuel emissions as cars do not have to start and stop at the exit gate.

➢ A new feature is currently being developed whereby Tel Aviv Residents can apply for a monthly subscription. This will make the solution ticketless for those subscribers as they wll not be issued any ticket or paper at entry to the parking facilities, and will receive a bill at the end of each month. This cuts down micro transaction both for the system as well as for the Residents.

➢ **How it works:**

- ➢ Tel Aviv is divided into 8 parking zones.

- ➢ Tel Aviv residents register at the municipality and are issued a parking sticker in their zone of residence.

- ➢ The sticker is vehicle specific and is registered under the license plate number.

- ➢ Tel Aviv residents park overnight in the municipal parking lots in their zones of residence for free, and receive discounts in other zones.

- ➢ Tel Aviv residents are automatically identified by their license plate for parking purposes.

- ➢ Via the interface to the municipal database, and the VRS input, the system knows when to permit the resident to park for free and when to calculate a discount, or identifies a non resident and demands full payment.

- ➢ As a vehicle enters the parking facility its license number is included on the parking ticket issued at the entrance to the parking facility.

➢ The parking fee is paid via POF according the length of stay, and special discounts, if applicable, according the plate number associated with the ticket

In the future

➢ Monthly payment and subscription options will eliminate Pay on Foot requirements

The automation has made it simpler and more convenient for the Municipal Corporation to provide this service via one single central control center.

The center consists of a number of large screens which show the numerous municipal parking lots at any given time. Computer stations enable interaction with the equipment on site at any of the given parking lots. Parking Customers can communication with the central Command and control room either via intercoms at the pay on Foot machines, or at the exit gate via an intercom button.

This Smart parking GUI, inventory control, video surveillance, centralized IP, and intercom communication enables efficient Command and control.

➢ Interface of the data of the number of cars currently parked in the municipal parking lots, to the municipal parking guidance system and to the interactive internet map provide a service to City

residents indicating which parking facilities are full, which are available and how many spaces are open in each.

➢ This information is available on LED signs throughout the city and are updated with current information on a real-time basis, enabling drivers to better plan more effective routes to available parking facilities, saving on gas and emissions.

➢ The parking system powered by VRS supports and enforces the Municipal Tariff policy. The enforceability had been much more difficult previously, and parking had not been a money maker for the City.

➢ 2 Controllers only are required to manage 60 parking lots at any given time and this service is provided 24/7 – thus saving resources and increasing efficiency. During peak hours (late afternoon/early evening), an additional controller is added.

The results in 1 and a half years of operations indicated that revenues from parking in the automated lots has increased by 30% over their pre-automated levels.

Tel Aviv residents have reported a higher level of satisfaction with the perceived fairness, ease and efficiency of the parking experience.