Self-Serve 24/7 Vehicle Dispatch "Keyosk"

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Executive Summary

The University of Nebraska – Lincoln Transportation Services Department is directly responsible for the management of 460 pool vehicles, indirectly responsible for 310 department owned vehicles and 166 "on loan" Federal Excess Property vehicles. Transportation Services is a 100% self-supporting entity, charging departments for fuel, maintenance, repair, and pool vehicle use (rental).

The majority of pool vehicles are assigned to "long-term rentals", with rental times from 28 days to 8+ years, while the balance are "short-term rentals" that are reserved on an hourly or daily basis. Prior to Spring, 2013, daily or short-term rentals were picked up during normal business hours (8:00 AM – 5:00 PM Mon – Fri) from two separate campus locations. A solution was sought to address limited vehicle availability, an ironic situation since the daily rental vehicle utilization numbers were poor. The primary issues uncovered were: 1) travel initiated outside normal business hours required vehicles to be dispatched the prior day, and 2) vehicles dropped off after hours were rendered out-of-service until the next business day. Thus, one day travel often removed a vehicle from availability two or more days.

Automation provided a solution for limited availability and poor daily rental utilization. "Keyosk," a custom built fully automated vehicle dispatch system, went live on March 1, 2013 with 24/7 self-serve daily rental dispatch at 2 locations. Keyosks at each location contain 36 – 3"x3" electronically controlled lock boxes, a driver's license scanner, and a data entry touch screen. Keyosk is available only to authorized drivers, validates their driver's license during the dispatch process, confirms dispatch & return date/time, and works with any type of vehicle key.

Since going live, daily rental vehicle dispatches have increased 30%, billable rental days increased 26%, vehicle utilization has improved 18%, and vehicle daily rental charge back rates were lowered an average of 40%. The initial cost of the Keyosk cabinets and reduction in daily rental income from lower rental rates is offset through the 26% increase in the number of billable rental days, and by not needing to replace the employee who staffed the second location. University faculty/staff now submit online rental requests 24/7, and within 15 minutes can pick up a University pool vehicle. The Keyosk self-serve system renders vehicles available on the driver's schedule, improves vehicle availability, lowers the cost to departments, and no longer limits drivers to picking up vehicles during Transportation Services normal hours of operation.

Organization

The University of Nebraska – Lincoln Transportation Services Department is directly responsible for the management of 460 pool vehicles, indirectly responsible for 310 department owned vehicles and 166 Federal Excess Property vehicles "on loan" to the University. Transportation Services is a 100% self-supporting department, and operates an internal service fund. Departments are charged for fuel, maintenance, repair and pool vehicle use (rental). Responsibilities include: 1) UNL vehicle acquisition, 2) liability insurance distribution, 3) vehicle rental, 4) updating rental rate schedules, 5) establishing and providing maintenance and repair procedures, 6) scheduling the disposal of all UNL vehicles, 7) title, license and registration activities for other University campuses' vehicles and 8) maintaining the USBank Voyager fleet card program used at all campuses.

The University of Nebraska-Lincoln, chartered in 1869, is an educational institution of international stature. UNL is listed by the Carnegie Foundation with the "Research Universities category, is a land-grant university, and a member of the Association of Public and Land-grant Universities (APLU). As the flagship campus of the University of Nebraska system, UNL works cooperatively with the other three campuses and system office to provide its student body and all Nebraskans a wide array of disciplines, areas of expertise, and specialized facilities.

Problem Statement

Evaluation of Transportation Services' rental pool revealed a high value but underutilized daily rental pool. Vehicles often sat idle due to limited opportunities for departments to pick up vehicles.

Daily rental pools consist of vehicles specifically acquired for daily rental purposes and vehicles that cycle in and out of long-term assignments. These rental vehicles are located on two campuses that are physically separated by approximately two miles. Vehicle dispatch for these two locations was limited to 8:00 AM – 5:00 PM Mon-Fri (i.e., no evenings or weekends). For vehicles returned outside business hours, a key drop box at each location allowed vehicles to be dropped off. Since a high percentage of University travel begins outside Transportation Services hours of operation, drivers were allowed to pick up vehicle keys at the end of the business day before travel was scheduled. This often resulted in a vehicle being unavailable for 2 days, even though used for only one day's travel. Additionally, vehicles returned after hours were not available until the next business day (e.g., a vehicle returned Friday evening was not available until Monday morning).

The Transportation office handles over 3,000 daily rental reservations per year. Although the vehicles were dispatched and gone for 7,500 days, they were billed for only 6,142 days. This annual loss of approximately 18% of billed days occurred when vehicles sat idle, not available for use by other departments, and resulted in significant lost income for Transportation Services.

<u>Design</u>

UNL Transportation Services researched various methods to address this vehicle utilization issue. With the status quo not an option, various methods were evaluated, considered, and some tested. These included: 1) increasing the size of the fleet (owned or using private lease/rentals), 2) expanding the days and/or hours of operation, and 3) partially or completely automating the dispatch process.

Increasing the size of the fleet would have prohibitively increased costs, and failed to improve active vehicle utilization. Expanding or changing the hours of operation also guaranteed an increase in costs. In review of the various best industry practices for partial or complete automation (e.g., ride-share control modules, key control panels, assigning multiple keys), it was determined a custom solution would best serve the University's needs.

Initial plans would have installed a hybrid system at one location (East campus), where vehicles would be dispatched/returned using a manual system during normal hours, but using an automated system after hours. After surveying our top 20% daily rental pool users regardless of campus location, and closely examining actual reservation experience, we discovered a flaw in the hybrid system theory. Our drivers had become so accustomed to a full service (e.g., staffed) system, they would continue making reservations for pick-up during business hours, pay for the pick-up day even though travel began the next day, and return during business hours so someone else would be responsible for fueling the vehicle. Results of this survey and experience monitoring pointed to using one method to dispatch or return vehicles, and to make it available 24/7. As an incentive for drivers and/or departments to soften their resistance to this drastic change, we lowered the daily rental rates by 40% in return for holding customers responsible to fuel and clean out vehicles for the next user.

We then proceeded to document the manual dispatch system step-by-step. From this documentation, it was decided what should or could be automated with today's technology, and what must remain a manual function. We also researched other fleets to see what systems had already been created, but found that the available systems all had limitations, and realistically could not meet our requirements.

Implementation

Implementation included the actual Keyosk (key cabinet) construction, Keyosk custom software development, fleet management interface development, testing, system enhancement, customer notification, customer testing, and go-live.

An early decision was made to use the renter's driver's license as the credential to trigger the checkout process. Nebraska Statute requires drivers must have their driver's license on them at all times when operating a vehicle. During manual dispatch, a driver frequently "left their license at home" or someone is sent to pick up the car who is not authorized to drive. Therefore, a method that ensures the actual driver has their license with them and is authorized to drive was high priority.

The system was required to operate with any of the wide range of vehicle keys (e.g., smart key, key fob, proximity keys, etc.), and the system would also need to be user friendly, self-explanatory, and have built-in options so we could assist drivers should a problem occur.

In our research, we found vendors that built electronically controlled mail boxes, safe deposit boxes, and ATM's. There were other vendors that built driver's license scanners and corresponding software. We found no vendors that built a system that combined electronically controlled boxes and driver's license scanners. After review of requests for information, Safepak Corporation was selected to build the first key control cabinets with a built in driver's license scanner that was fully capable of communicating with our automated vehicle reservation system.

Transportation Services' fleet management system includes a module that processes all of our vehicle reservations. All rental requests are submitted on-line via an in-house designed secure rental request system. In-house programming staff also built the interface between the

vehicle reservation system and the Safepak key control cabinet. During these planning and testing sessions, naming the new system "Keyosk" emerged.

In order to handle the average number of dispatches, each campuses' Keyosk would require 24 electronically controlled 3"x3" boxes. The license scanner component would need to be able recognize driver's licenses from all 50 states. Each Keyosk would need to communicate with our fleet management system, match drivers to vehicle reservations, and send email confirming vehicle dispatch/return and update information through the existing fleet management system tools.

Two Keyosk's were delivered, setup and tested in October 2012. The first Keyosk was installed on city campus, and management watched anxiously each dispatch step-by-step to ensure dispatch and return worked properly. This concern quickly proved unnecessary, when the second person to use the Keyosk entered the lobby, checked out a vehicle and was on the road in a matter of minutes. Soon after, another driver properly returned a vehicle using the Keyosk routine. Email confirmations and interface updates were our first indications that all necessary actions took place as designed.

In February 2013, the second Keyosk was installed at the east campus location. During business hours a service attendant was still present to fuel and clean vehicles and assist drivers, but after-hours the self-serve system was available. On March 1, 2013 UNL Transportation Services went fully self-serve for all daily rental vehicle dispatch/returns, the service attendant position assigned to east campus was moved to city campus, and a 50% FTE service attendant retired. In July 2013, the self-serve system was enhanced by replacing both 24 box Keyosk's with "touch screen" 36 box Keyosk's. Additionally, as the final step for a truly self-serve dispatch system, the online reservation system was switched from manual rental request

processing to instant processing. This allows a rental request to be submitted anytime 24/7 and if a vehicle is available, it can be picked up 15 minutes later.

Since going live, Transportation Services utilization numbers have improved substantially. Cost of the conversion to the Keyosk cabinets and lost income from lower rental rates was completely offset by 1) not replacing a retiring 50% FTE service attendant and 2) an increase in the number of days vehicles are used and charged. Compared to the 'baseline' utilization statistics cited above, reservations have increased 30%, billable rental days have increased 26%, and total daily rental vehicle utilization has improved 18%. Due to the improved vehicle availability, Transportation Services is now able to allow additional vehicles to be assigned to more financially stable long-term/monthly rentals and avoid the purchase of additional units to satisfy long-term rental demand.

Retrospect

Since this pioneering effort was not able to anticipate the large increase in daily rental reservations, we failed to build the system large enough. Design of the system was based on the historical peak number of daily rental reservations. However, the lower daily rental rates led to a significant increase in vehicle reservations. If our reservation numbers had remained unchanged or grown modestly, 24 electronically controlled boxes at each site would have been more than adequate.

The original plan was to improve utilization and gradually downsize the fleet, meeting the University's needs with fewer vehicles. During the first quarter of operation, vehicle utilization increased by 14%, and dispatches increased 17%. With these numbers, and the vendor's enhancement to touch screen service, we replaced the original Keyosks with touch screen 36 box cabinets. Even with 12 additional boxes per site, we have already had to "convince" drivers they should use a sedan or van in the Keyosk system, just so we wouldn't have to return after hours to load another vehicle into the system. In evaluating the baseline numbers, we should not have anticipated maintaining the same number of reservations flowing through the system and reducing the size of the fleet, but planned to double the number of reservations (48) per site and keep the fleet size unchanged.

Questions should be directed to Patrick Barrett, Director, UNL Transportation Services. Phone: (402) 472-7766 or email: (pbarrett1@unl.edu).

Cost for Keyosk System	
Touch screen key control cabinet[1]	$6,679.85
Install power outlets and computer ports at two locations	$1,825.00
Install key card access at two locations	$13,482.43
Total	$21,987.28

[1]UNL's two campus environment required purchase of two Keysok's for a total capitalized $13,259.70 expense.