NC Department of Transportation

Challenge
Reduce wait times in Division of Motor Vehicles (DMV) driver license offices, thereby improving customer satisfaction and employee morale.

North Carolina's Division of Motor Vehicles 'drives change' through data analysis

JMP® helps analysts improve customer service at DMV offices across the state

The North Carolina Department of Transportation (NCDOT) routinely analyzes road condition and traffic data to ensure the safety of the traveling public. As one of NCDOT's largest divisions – and one of its highest revenue generators vis-à-vis driver and vehicle fees – the Division of Motor Vehicles (DMV) realized that analyzing customer data, specifically overall wait time at DMV driver license offices, was a critical element in understanding the current DMV customer experience. The collection and analysis of data across high-volume driver license offices yielded the first baseline data set for the state. To improve customer service, DMV launched the "Driving Change" initiative to reduce wait times and improve customer experiences at DMV offices.

Reducing wait times to improve the customer experience

The division conducted a "voice of the customer" survey in January 2014. It asked customers to provide information about their experience in driver license offices and to share suggestions that would help the agency improve customer service and satisfaction. One of the main areas of concern was lengthy wait times. Customers often had to wait more than 30 minutes just to initiate a transaction. There was no target at the time for what was considered a reasonable wait time or total transaction time; it was known, however, that the times were longer than desired.

The goal for this project was to reduce the average total time customers spent in driver license offices, resulting in more transactions completed by DMV and a more efficient, less time-consuming customer experience.

Staff from both NCDOT and DMV developed a collaborative plan. The NCDOT Governance Office oversees Lean Six Sigma (LSS) improvement projects and training efforts agencywide. Customer service and efficiency improvements are led by LSS Black Belt and Green Belt practitioners from the Governance Office. They perform data collection and analysis while leading and coaching LSS projects and project teams.

The first step was to conduct Lean Six Sigma training at DMV. DMV additionally implemented mandatory customer service training for all driver license examiners. Data was then collected throughout the state from approximately 7,200 customers over 42 days by a team that consisted of LSS Black Belts and Green Belts from NCDOT and DMV examiners trained as LSS Yellow Belts. The analysis was data-rich – with over 100,000 data points, including all segments of transaction and wait times (e.g., total time by day of week, arrival time, by transaction

category, by location). The analysis found there were longer customer wait times on Fridays and Tuesdays, and more visits during lunchtime throughout the week.

Sensitivity analysis in JMP® helps validate Lean Six Sigma findings

The NCDOT team, along with an LSS contractor, used JMP to analyze the potential causes for excessive wait times and identify which causes were most significant. To augment the work of the team, a North Carolina State University graduate student used simulation modeling with Simio to help determine optimum staffing.[1] He used a Monte Carlo simulation to perform a sensitivity analysis to test and validate the various changes proposed by the LSS team. His simulation model showed that a complement of 13 examiners at the busiest driver license offices was optimal.

The team provided DMV leadership with nearly 50 potential solutions to reduce total customer time in driver license offices. DMV introduced extended hours at 19 of its busiest offices around the state, including weekend hours in some locations. In the fall of 2015, DMV debuted online driver license renewal and, to date, more than 600,000 North Carolinians have avoided the line by renewing their license online.

Other improvements include driver license office upgrades to enhance efficiency and improve customer experience, including the acceptance of debit and credit cards. The DMV redesigned offices to improve customer flow, procured additional work stations and printers, placed vision and sign testers at the front desk, introduced self-serve kiosks,

and added "greeters" at select offices to acknowledge customers promptly and determine issuance eligibility immediately.

NCDOT's Lean Six Sigma program continues to expand and now encompasses teams and projects on multiple levels throughout the organization.

Interactive visualizations help NCDOT staff find interesting patterns in the data

By using JMP to examine the relationship between location and various commodity factors, NCDOT staff were able to balance work-load distribution in NCDOT's purchasing department. Staff assigned to this project found the JMP Graph Builder to be a simple and easy-to-use tool that helped them to explore and visualize data interactively, alternating between graph types with just a single click. Tree maps in JMP also proved to be an invaluable way of viewing and observing patterns in complex categorical data.

Meeting customer expectations is no easy task, and it's becoming more challenging as the state continues to grow. Whether accelerating project delivery, maintaining roads or decreasing wait times at DMV offices, the staff is committed to providing the most efficient and effective services to its customers.

[1] Landge, Swapnil Jayant. Employing Simulation Modeling in the Lean Six Sigma Methodology.

Solution
Staff team up with Lean Six Sigma and JMP to visualize and interpret transaction data gathered at driver license offices across the state.

Results
The project is ongoing through the continued rollout of various time-saving processes and much-needed technology updates at the busiest DMV offices statewide. Through these strategic improvements, data indicates that average wait times have been reduced.

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