

INTEGRATED MANAGEMENT OF TRAFFIC VIOLATIONS: IMPACTS OF DIGITAL TRANSFORMATION ON STATE PUBLIC ADMINISTRATION

GESTÃO INTEGRADA DE INFRAÇÕES DE TRÂNSITO: IMPACTOS DA TRANSFORMAÇÃO DIGITAL NA ADMINISTRAÇÃO PÚBLICA ESTADUAL

GESTIÓN INTEGRADA DE INFRACCIONES DE TRÁNSITO: IMPACTOS DE LA TRANSFORMACIÓN DIGITAL EN LA ADMINISTRACIÓN PÚBLICA ESTATAL



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ABSTRACT

This article analyzes the experience of state public administration in the centralization and modernization of traffic violation management, focusing on improving road safety and reducing impunity. The initiative, led by the State's innovation laboratory, involved the redesign of processes and the adoption of technological solutions aimed at creating a single and integrated digital system. Faced with a monthly average of 70,000 violations and 15,000 defenses and appeals, software was implemented to automate the registration and processing of citations, operating in an integrated manner with existing systems. The complete digitalization of workflows increased efficiency, reduced processing times, and ensured greater reliability and respect for the right of defense. The centralization of activities, previously fragmented, generated resource savings and allowed the reassignment of public servants to strategic functions. Cases began to be judged more quickly and uniformly, strengthening citizens' trust in public administration. The results include a growth from 13% to 29% in the use of digital channels for defenses and appeals; elimination of the backlog of registrations through automated bots, reducing the average processing time from 30 days to 2 business days; and the adoption of electronic ticket books, with a significant reduction in paper use. This experience demonstrates the potential of digital transformation in public management, especially in the traffic sector, offering a replicable model oriented toward efficiency, legality, and road safety.

Keywords: Traffic Management. Digital Transformation. Administrative Centralization. Road Safety. Public Efficiency.

RESUMO

Este artigo analisa a experiência da administração pública estadual na centralização e modernização da gestão de infrações de trânsito, com foco na melhoria da segurança viária e na redução da impunidade. A iniciativa, conduzida pelo laboratório de inovação do Estado,

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envolveu a reformulação de processos e a adoção de soluções tecnológicas voltadas à criação de um sistema digital único e integrado. Diante de uma média mensal de 70 mil infrações e 15 mil defesas e recursos, foi implementado um software que automatiza o registro e o processamento das autuações, operando de forma integrada aos sistemas já existentes. A digitalização completa dos fluxos aumentou a eficiência, reduziu prazos e assegurou maior confiabilidade e respeito ao direito de defesa. A centralização das atividades, antes fragmentadas, gerou economia de recursos e permitiu o redirecionamento de servidores a funções estratégicas. Os processos passaram a ser julgados de forma mais célere e uniforme, fortalecendo a confiança do cidadão na administração pública. Os resultados incluem: crescimento de 13% para 29% no uso de canais digitais para defesa e recurso; eliminação do passivo de cadastros com robôs automatizados, reduzindo o prazo médio de 30 dias para 2 dias úteis; e adoção de talonários eletrônicos, com significativa redução no uso de papel. A experiência demonstra o potencial da transformação digital na gestão pública, especialmente no contexto do trânsito, oferecendo um modelo replicável e orientado à eficiência, à legalidade e à segurança viária.

Palavras-chave: Gestão de Trânsito. Transformação Digital. Centralização Administrativa. Segurança Viária. Eficiência Pública.

RESUMEN

Este artículo analiza la experiencia de la administración pública estatal en la centralización y modernización de la gestión de infracciones de tránsito, con énfasis en la mejora de la seguridad vial y en la reducción de la impunidad. La iniciativa, liderada por el laboratorio de innovación del Estado, implicó la reformulación de procesos y la adopción de soluciones tecnológicas orientadas a la creación de un sistema digital único e integrado. Frente a un promedio mensual de 70.000 infracciones y 15.000 defensas y recursos, se implementó un software que automatiza el registro y el procesamiento de las sanciones, operando de manera integrada con los sistemas ya existentes. La digitalización completa de los flujos aumentó la eficiencia, redujo los plazos y garantizó mayor confiabilidad y respeto al derecho de defensa. La centralización de las actividades, antes fragmentadas, generó ahorro de recursos y permitió la reasignación de servidores a funciones estratégicas. Los procesos comenzaron a resolverse de forma más rápida y uniforme, fortaleciendo la confianza de los ciudadanos en la administración pública. Los resultados incluyen: crecimiento del 13% al 29% en el uso de canales digitales para la presentación de defensas y recursos; eliminación del rezago de registros mediante robots automatizados, reduciendo el plazo promedio de 30 días a 2 días hábiles; y adopción de talonarios electrónicos, con una significativa reducción en el uso de papel. La experiencia demuestra el potencial de la transformación digital en la gestión pública, especialmente en el ámbito del tránsito, ofreciendo un modelo replicable orientado a la eficiencia, la legalidad y la seguridad vial.

Palabras clave: Gestión del Tránsito. Transformación Digital. Centralización Administrativa. Seguridad Vial. Eficiencia Pública.

1 INTRODUCTION

Digital transformation has been consolidated as one of the main vectors for the modernization of public administration in Brazil, especially in areas marked by complex operational flows and high demand for service, such as the management of traffic violations. The centralization and digitalization of public services are fundamental strategies to ensure greater efficiency in the provision of services, promote transparency in administrative actions, promote the economy of public resources, and ensure full respect for the rights, privacy, and guarantees of citizens in interaction with the State.

In Minas Gerais, the creation of the State Coordination of Traffic Management (CET-MG), linked to the State Secretariat of Planning and Management (Seplag-MG), marked a turning point in public traffic policy. An adequate organizational structure and clear competencies are essential for the effectiveness of monitoring and control, strengthening citizens' trust in institutions (CANELA; NASCIMENTO, 2009). In this context, the administrative reform approved by the Legislative Assembly of Minas Gerais transferred the competencies of Detran-MG to the Secretariat of Planning and Management (Seplag), which created the State Coordination of Traffic Management (CET-MG). The new structure began to assume attributions previously concentrated in the State Department of Traffic (Detran-MG), representing not only an institutional reconfiguration, but the adoption of a model oriented to innovation, simplification of processes and strengthening of the state's capacity to provide public services.

CET-MG was organized into three main business areas — Infractions, Driver's License and Vehicles — in addition to a transversal area focused on the transformation of traffic services. Within the scope of the management of infractions, the activities are conducted by the Superintendence of Infractions and Driver Control, responsible for the analysis, processing and control of administrative penalties. This Superintendence is composed of two directorates: the Directorate of Infractions and the Directorate of Administrative Traffic Processes, responsible for the registration of infractions, application of the penalties provided for in the Brazilian Traffic Code and the treatment of defenses and administrative appeals.

Decree No. 47,974/2020 instituted the ICT Policy in Minas Gerais, establishing guidelines to offer public services in an agile, accessible and innovative way, ensuring integrated and transparent solutions. In addition, Decree No. 47,441/2018 created the Administrative Simplification Policy, aimed at simplifying services and improving service, actions coordinated by Seplag and LAB. MG, a partnership with the João Pinheiro Foundation.

Faced with an initial scenario characterized by fragmented processes, high dependence on physical documents, and poorly integrated systems, CET-MG, in partnership with the Laboratory of Innovation in Government of Minas Gerais (LAB.mg), started in 2023 a comprehensive process of diagnosis and redesign of the management of traffic violations. From this work, a set of strategic guidelines was defined aimed at the integral digitalization of processes, the administrative centralization of activities and the implementation of automation technologies.

This article presents the results of this digital transformation at CET-MG, with a focus on the integrated management of traffic violations. The study aims to analyze the changes implemented and their impacts on operational flows, efficiency indicators and the quality of services provided to citizens. The experience of Minas Gerais, by promoting technological solutions with high adherence to the institutional reality and focus on continuous improvement, is configured as a public management model oriented to innovation and with high potential for replicability.

2 METHODOLOGY

2.1 DESIGN THINKING AND AGILE PROJECT MANAGEMENT

Based on these methodologies, the concept of Minimum Viable Product (MVP) was adopted for the implementation of digital improvements, prioritizing fast deliveries that can add immediate value to the user. The improvements were rolled out incrementally, allowing each delivery to be evaluated, adjusted, and improved based on continuous feedback from end users — including traffic agents, police officers, and citizens — basing decision-making on the actual perception of the use and operation of the solutions presented. In this way, co-creating with the operational team and the end user has become a powerful strategy to ensure that solutions meet expectations, promoting a more effective, participatory and sustainable digital transformation.

2.2 QUALITATIVE RESEARCH AND DOCUMENT ANALYSIS

This study is characterized as a qualitative research, structured from the case study approach, specifically focused on the integrated management of traffic violations carried out by the State Coordination of Traffic Management (CET-MG). The documentary research method was adopted because it enables a detailed and in-depth investigation of the digital transformation implemented, its stages and effects on public administration. According to Chaumier (1974, apud Bardin 2016, p. 51), documentary research can be defined as "an operation or a set of operations aimed at representing the content of a document in a form

different from the original, in order to facilitate, at a later stage, its consultation and referencing". In addition, Yin (2015, p. 32) highlights that "the case study is an empirical investigation that investigates a contemporary phenomenon within its real context".

The documentary research involved the detailed analysis of official documents made available by CET-MG, including technical reports, project plans, operational flowTables, internal regulations, records of the Electronic Information System (SEI) and performance reports of the technological systems adopted, such as Power Automate and the AUTUA application. The documents analyzed cover the implementation period of the actions studied, from August 2023 to the present moment, allowing a comprehensive view of the process from conception to its execution and consolidation.

The collection of documentary data was conducted in a systematic and rigorous manner, seeking to identify aspects such as the volume of processes handled before and after the implementation of digitalization and automation, average deadlines for processing processes, percentage of use of digital channels by citizens and operational efficiency after adoption of technological solutions.

For data analysis, an interpretative qualitative approach was adopted, based on the content analysis technique as proposed by Bardin (2016), who defines this method as a set of communication analysis techniques aimed at obtaining, through systematic and objective procedures, the description of the content of the messages. This method allowed the identification of clear relationships between the adoption of technologies and the improvements observed in public management, contributing to the construction of a detailed overview of digital transformation at CET-MG.

3 RESULTS AND DISCUSSION

The analysis of the case study of the digital transformation of traffic violation management in Minas Gerais reveals a user-centered, participatory and public innovation-oriented approach. This process was conducted by the State Coordination of Traffic Management (CET-MG) with technical support from the Laboratory of Innovation in Government of Minas Gerais (LAB.mg), linked to the State Secretariat of Planning and Management (Seplag-MG). The partnership between these institutions allowed for a qualified institutional intervention, focusing on the process redesign, organizational restructuring and development of digital solutions applied to the administrative reality.

Considering a monthly average of 70 thousand infractions and 15 thousand defenses and appeals, the main challenges faced by CET-MG involved the optimization of the management of traffic violations and the demobilization of the Regional Traffic Districts

(Ciretran), responsible for decentralized service in the interior of the State, aiming at the reallocation of professionals to essential public security activities of the Civil Police.

Faced with this challenging scenario, LAB.mg played a key role in identifying and analyzing existing operational flows, conducting a thorough diagnostic work and proposing specific improvements. The joint action resulted in the clear definition of three central strategic guidelines: integral digitization of physical processes, administrative centralization, and implementation of automation technologies for recording and processing infractions. These actions sought to ensure greater operational efficiency, transparency in the analyses and speed in the provision of services.

At the beginning of the administration, in mid-2023, about 80% of the document volume received by the centralized protocol of the Administrative City, the unit responsible for receiving documents from all State Secretariats, came from the transit area. This data clearly reflected the high degree of dependence on physical processes in the management of infractions, highlighting the urgency of implementing profound changes to ensure greater traceability, speed and quality in citizen service.

The work carried out between August and December 2023 was structured in sequential and interdependent stages. Initially, there was a technical alignment to define the scope, schedule, responsibilities and objectives. Subsequently, the exploratory phase began, marked by interviews with civil servants, documentary analysis, studies of the applicable legislation and detailed mapping of the existing operational flows. This step was crucial to identify bottlenecks, rework, and institutional vulnerabilities, especially in the context of transition to a digital model.

Complementing this exploratory phase, a benchmarking was carried out with institutions such as Detran of Mato Grosso do Sul, Detran of São Paulo, Detran of Paraná, Federal Highway Police, Court of Justice of Minas Gerais, Military Police of Minas Gerais and Federal University of Rio Grande do Norte. The main objective of this activity was to identify good practices in the use of digital technologies and in the management of processes related to traffic violations, generating inspiring elements for an innovative and replicable solution in the context of Minas Gerais.

Based on this information, co-creation workshops were held with civil servants from the areas involved, resulting in the systematization of 87 suggestions categorized into systemic, organizational, procedural and normative improvements. Technical training on automation and innovation was also offered, strengthening the autonomy of the teams involved.

Then, a complete redesign of the processes was developed, including two versions: an incremental one, with adjustments to the existing systems, and a structural one, aiming at a single, digital and integrated system, capable of automating critical steps and increasing data traceability. Visual diagrams, proposals for document standardization, revision of forms with simplified language and definition of functional requirements were important aspects of this redesign.

The methodology used stood out for the protagonism of the servers of the various areas of CET-MG, ensuring greater adherence of the solutions to the operational reality and favoring the consolidation of an innovative institutional culture focused on continuous improvement and the value delivered to the citizen. Below, specific actions, their peculiarities and the results obtained with their implementation will be detailed.

3.1 ADMINISTRATIVE CENTRALIZATION OF THE PROCEDURAL PROCESS

The fragmentation of the processing of administrative traffic processes, historically distributed among more than 70 Regional Traffic Districts (Ciretran), was one of the main obstacles to uniformity, predictability and quality control in the management of infractions in Minas Gerais. Each unit had a different degree of maturity, technical training and volume of work, which resulted in variable criteria for judgment, difficulty in supervision and fragility in the standardization of procedures.

In order to overcome these challenges, the centralization of administrative traffic processes was implemented, one of the pillars of the transformation promoted in the management of infractions in the State. This measure involved the complete restructuring of the Directorate of Administrative Traffic Processes, resulting in the full transfer of the competence of analysis, instruction and judgment of these processes to a specialized technical nucleus linked to the Directorate.

The decision to centralize was made as a strategic guideline of public management, supported by international and national studies and practices that point to centralization as an effective mechanism to gain scale, reduce waste, concentrate expertise and strengthen institutional control. According to Peci and Sobral (2009), centralization can be fundamental to ensure coherence in the implementation of public policies, reduce operational asymmetries and strengthen state capacity. Di Pietro (2019), in turn, points out that, in certain contexts, the concentration of administrative competencies in a central unit contributes to greater efficiency, less dispersion of resources, and qualification of state action.

In the context of CET-MG, centralization was preceded by a careful process of mapping decentralized flows, internal organizational restructuring, and technical

communication with the units involved. To ensure a safe transition without prejudice to the citizen, a communication channel was maintained, while procedural routines were progressively absorbed by the centralized structure.

The experience is also in line with international guidelines, such as those of the Organization for Economic Cooperation and Development (OECD, 2020), which recommend the adoption of lean, integrated, and digital administrative structures as a way to modernize the State and expand the focus on results. The World Bank (2013) reinforces this approach by highlighting that centralization can generate significant productivity gains, especially when associated with the digitalization of processes and the adoption of performance-based management platforms.

In the case of Minas Gerais, centralization made it possible to qualify the technical staff, organize teams by process profile (suspension, cassation, defenses, appeals), establish uniform analysis criteria and create continuous monitoring routines, with goals and productivity analysis. In addition, it made it possible to rationalize the use of the workforce, freeing up Ciretrans employees to work in core activities of the Civil Police — a strategic gain for the State as a whole, by articulating traffic policy with public security.

Among the benefits already observed are: greater speed in the processing of processes, with a reduction in the average time between protocol and final decision; reduction of rework and procedural inconsistencies, thanks to the standardization of decision-making criteria; improvement of the control of legal deadlines, ensuring due process and the rights of citizens; improved traceability, with digitized and monitorable flows in real time; and savings in operational resources, with less dependence on physical transportation and face-to-face service.

More than an organizational measure, the centralization implemented materialized a paradigm shift in the conduct of traffic sanctioning processes in Minas Gerais. It has made it possible to move from a reactive, decentralized and vulnerable model to a more technical, integrated, efficient and citizen-oriented public management logic.

3.2 UNIFIED SYSTEM OF INFRACTIONS AND ELECTRONIC TICKET BOOK

During the diagnosis carried out by the Laboratory of Innovation in Government of Minas Gerais (LAB.mg), the operational flows related to the life cycle of traffic violations in the state were analyzed in detail. The process began with the acquisition of physical blocks of infraction, through the contracting of specific graphic services. These blocks were distributed to the Regional Traffic Districts (Ciretrans), units of the Civil Police spread

throughout the state, responsible for forwarding them to the Military Police agents who carried out the manual drawing up of the infraction notices.

After the manual drawing up by the agents, the records were delivered again to Ciretrans or to the centralized team of the Infractions Directorate in the capital, responsible for typing the data contained in the paper into the database via the SDAK mainframe system. The subsequent digitization of these records was centralized in the CET, and there was a delay in sending the records from the interior. With the typing in the SDAK system, the fine became legally valid, and was then notified to the driver by mail or by the Digital Traffic Card.

During the period of 30 days after the notification of the fine, the driver may present a defense of the fine or indicate the offending driver. If there was no defense or indication from another driver, the fine automatically became an infraction, with the generation of a fine and a score on the driver's record. Against the infraction, it was possible to file an appeal of first instance with the Administrative Board of Infraction Appeals (JARI), and, if necessary, an appeal of second instance with the State Traffic Council (CETRAN).

Each step of the process mentioned was carried out in different systems and partially on paper, generating significant challenges in terms of operational efficiency, control, traceability and communication between databases. The main system used was the SDAK, which manages the state database of vehicles and interfaces with the National Registry of Infractions (RENAINF). At the same time, other systems served specific functions, such as SIAUT for registering defenses, JARI and CETRAN's own systems for resources, and SDMU (mainframe) for distribution, cancellation and regionalization of infraction notices, FICI System, indication of offending driver and scoring system. In addition, the digitized AIT image was stored in the cloud for only 90 days, and then transferred to physical media (CDs).

After detailed analysis and market research, the feasibility and need for an integrated system capable of covering all these steps and fully digitizing the infraction notice was verified. Thus, it was decided to hire the Radar System, developed by the Federal Data Processing Service (SERPRO), which includes the AUTUA module, Electronic Infraction Receipt, intended to completely replace the manual process of drawing up and recording infractions.

Radar is a traffic violation management platform that integrates all national traffic bases, including RENAINF (violations), RENACH (drivers) and RENAVAN (vehicles). In it, all previously fragmented processes are integrated into a single system, allowing instant communication between all stages, eliminating the need for printing and physical transmission of documents. One of the most outstanding features is Autua, an electronic ticket book of infractions made available in the form of a mobile application for traffic agents.

Autua facilitates the completion of information, automates vehicle base queries and ensures the complete and correct completion of infraction notices, significantly reducing common typing errors and manual interpretation.

For the implementation of the Radar, it was initially necessary to carry out integrations between the existing systems, especially the state bases of vehicles and drivers that remain linked to the current system managed by PRODEMGE. During this period, the databases were duplicated, ensuring a safe and continuous transition until the complete migration to the Radar.

The implementation of Autua began with controlled tests in August 2024, involving 20 agents trained specifically for this purpose. The success of these tests resulted in gradual expansion, starting with a pilot project in November and December 2024, with 200 agents from the Traffic Battalion of the Military Police in Belo Horizonte. Since July 2025, the use of Autua has expanded significantly, surpassing the mark of 2 thousand agents trained and qualified to use the system. It is expected that by the end of 2025 all PMMG agents will have access to the application

Throughout the implementation of the Autua system, there was an important technical evolution in the methodology of training offered to traffic agents. The initial training for the 20 agents participating in the tests was carried out in person. In the subsequent stage, with the expansion to 200 agents, a synchronous virtual approach was adopted, dividing the training into four classes of 50 agents each, with classes lasting two hours. After this stage, considering the target audience of more than 15 thousand agents, a complete material was developed for a course in the Distance Education (EAD) modality, available on the official platform of the State Secretariat for Planning and Management. The distance learning course was launched at the end of the first semester of 2025, allowing the constant and simultaneous expansion of the training of interested agents, respecting the voluntary nature of the use of the application.

Despite voluntary use and limitations, such as the requirement for agents' personal Android devices and the limited ability to release devices on a daily basis, adoption has been growing. The average time to draw up infractions fell from approximately 5 minutes to only 30 seconds per infraction. In addition, frequent errors, such as incorrect plate filling and omission of required fields, have been drastically reduced. The system also offers automatic GPS location, automatic filling of vehicle data from the license plate and immediate communication of the infraction to the citizen, with digital notifications within 2 hours after drawing up, compared to 18 days of the previous paper process. These advances confirm

the effectiveness of the technological solution and its significant contribution to efficiency, accuracy, and transparency in the management of traffic violations.

Table 1

Description of costs involved with the paper x electronic receipt

	DIRECT COST	INDIRECT COST	UNMEASURED COSTS
LONNAIRE PAPER	Annual Table Cost: 170.000,00	Police force deployed to Typing: 600,000 AITs typed inside	Cost of carrying out the process of Shopping Storage room maintenance cost Cost of document storage: Includes preparation for storage and physical cost. Cost of assembly, organization and shipping via SEI. PMMG logistics cost: removal and distribution of blocks. Logistical cost in the full return of AITs: Includes use of police personnel and resources for transportation and preparation.
	Typists: 900,000.00	Estimate: 20,000 hours of police work displaced from the core activity	
	PRODEMGE: Support and development: R\$ 1,000,000.00 Accommodation: R\$ 5.000.000,00	Uncollected fines for inconsistency in AITs: Estimated value in 2024: BRL 26,198,895.00 Average amount per fine appealed: R\$ 1,037.58.	
ELECTRONIC MARATHON	R\$ 2,376,000.00 Base: 900,000 infractions x R\$ 2,64 Cost of assembly and storage of SEI and PRODEMGE remain in the flow with AUTUA deployed		

Source: prepared by the authors.

Table 2

Simplification of process steps with the paper vs. electronic receipt

	PAPER TALORÁRIO	ELECTRONIC MARATHON
NUMBER OF STAGES OF THE PROCESS	10	4 (Eliminate 8 steps, simplify 2 steps and bring 1 get 2 new release of assessment devices).

Source: prepared by the authors.

The expansion of Autua is essential to enable the complete migration to the Radar system, allowing CET-MG to fully enjoy the benefits of an integrated and digitalized model for managing traffic violations. The expectation is that this migration will still occur in 2025. As a third stage, the dissemination of the Radar to the municipalities of the State is planned, with the objective of standardizing inspection practices and expanding the use of technology as an instrument to support road safety throughout the territory of Minas Gerais. This phase will be accompanied by training actions, technical support and institutional articulation, strengthening cooperation between the State and municipalities. With this, Minas Gerais

advances in the consolidation of a more modern, efficient and citizen-centered public traffic policy.

3.3 AUTOMATION OF PROCESSES FOR DEFENSE OF FINES AND APPEAL OF INFRACTIONS

One of the priority challenges identified was the management of Defenses of Fines and Appeals of Traffic Violations. Initially, the entire process took place manually, on paper, even when requests were received digitally, requiring printing and physical handling of documents. This practice resulted in delays, high operating costs, in addition to generating significant delays in granting the suspensive effect of infractions, often resulting in undue fines and legal complications.

CET-MG then implemented an initial process of digitizing the documents received, using the Electronic Information System (SEI). However, in view of the large monthly volume of approximately 15 thousand cases, of which 8 thousand were specifically Assessment Defenses, the urgent need for automation of these activities was quickly realized. With a reduced team of only 12 people to perform the entire administrative process (registration, assembly, forwarding, closure and document searches), manual work became unfeasible and generated a significant liability of pending processes.

The Fine Defense process receives demands both physically and digitally. In digital format, the process was received through a specific system, the Assessment Defense System (SIAUT), in which initially the reception took place for immediate generation of the suspensive effect of the infraction. Then, the attached documents were used to generate the cover of the process and inserted into the SEI. The process was then forwarded to an advisor responsible for analyzing and issuing the opinion, which was registered both in the SEI and in the SIAUT. After this analysis, another server of the team verified the data and closed the process in the system. For the processes that had pending issues related to the lack of the Traffic Infraction Notice (AIT), the initial procedure was completely manual. The server needed to access the SAE system to identify the process number, then check the database to locate the physical media (CD) in which the record was stored, download the scanned file, attach it to the process in the SEI and, finally, forward it for analysis.

After identifying possible immediate improvements in the process, before changing the system to RADAR, a partnership was started with the Automatiza MG project, an initiative of the state government linked to the Department of Planning and Management, for the development of automated robots through the Power Automate software. Initially, it was attempted to develop a single robot for the complete process, however, over the course of

development, it was concluded to be more effective to build smaller, purpose-built robots to quickly solve the identified bottlenecks.

The first two robots implemented simultaneously were the one for receiving the defenses via digital protocol, quickly solving the bottleneck in the generation of the suspensive effect, and the robot dedicated to locating the pending Infraction Notices (AIT) necessary for the judgment of the defenses. With the implementation of the reception robot, the existing liability, which exceeded four thousand processes in the most critical moments, was quickly reduced and the average time for reception and registration of the Defenses

A specific robot was also developed for the closure of processes, which automatically checks the defense situation in the SEI and in the SIAUT system, finalizing the procedure and ensuring accuracy in the results. These robots require constant adjustments and have been replicated on several machines to optimize their use, especially at times of less server activity.

Currently, a new robot is in an advanced stage of implementation aimed at receiving the Defenses sent by the Post Office and digitized in the central protocol of the Administrative City. This robot will have the ability to identify and interpret handwritten or typed documents, automatically register in the system, generate the block, attach to the SEI and forward for analysis, complementing the automation cycle and ensuring greater operational efficiency for the near future.

Another robot that is being developed by the Automatiza.mg is the AI robot for suggestion of analysis and opinion of the Defense of Assessment, which will be fundamental for increasing productivity in the analysis and the consequent elimination of liabilities, avoiding the prescription of the Defense, which occurs 365 days after the initial protocol. The delivery of this robot is scheduled for the end of 2025.

After the initial implementation and delivery of the robots by the Automatiza MG team, the internal team of the Infractions Directorate started to play an active role in the management of these technological tools. Constant monitoring of the robots was carried out, accompanied by continuous actions to map failures and identify opportunities for improvement in automated processes. This close monitoring enabled the development of essential technical expertise among the servers, who acquired the ability to make adjustments and improvements directly to the implemented robots.

With the knowledge acquired, the internal team was able to replicate these technological solutions in the Infringement Appeal processes, which have similar stages and characteristics to the Defense process, but operating in different systems. The resources also reach the Board through physical and digital channels, facing challenges similar to defense

processes, such as undersizing of the team, 100% manual and repetitive work, accumulated liabilities for registration and analysis, often due to the difficulty in locating the Traffic Infraction Notices (AIT).

Currently, all the robots initially developed for the Defense processes have already been replicated, with the necessary adaptations, in the Infringement Appeal processes. This replication has had significant impacts, resulting in a significant reduction in existing liabilities and a substantial reduction in the average time required for receipt and treatment of the appeals. This progress allowed the team to allocate efforts to more strategic activities and continuously improve the service provided to citizens.

In general, the implementation of automated robots has provided significant results in the management of defenses and appeals of infractions. The average time for receiving cases was significantly reduced, falling from 30 days to just 2 working days. The location of the Traffic Infraction Notices (AIT) was largely optimized, contributing to the reduction of the liability of defenses pending analysis, which went from 60,000 to less than

25,000 cases. In the first half of 2026 alone, about 10,000 records were located for pending appeals. In terms of daily operational capacity, it is noteworthy that the AIT search and attach robot performs an average of 770 processes per day per machine. The robot responsible for the digital reception of defenses processes approximately 270 daily processes, ensuring complete compliance with the demand. The defense process assembly robot, due to possible instabilities, performs an average of 48 daily processes, requiring operation on multiple machines to increase its efficiency. As for the appeal processes, the robot that previously checks the situation of the defenses performs about 290 processes daily, while the robot that assembles these processes operates with a daily average of 150 processes, distributed in several workstations. The robot for the digital reception of the processes of the Administrative Board of Infraction Appeals (JARI) reaches a daily average of 180 processes, which fully meets current needs.

An important limitation faced during the automation process was the absence of equipment dedicated exclusively to the execution of automated robots. To overcome this challenge, the replication of robots on the individual machines of the Board's servers was adopted as a strategy. Robots began to operate predominantly during periods of lower use of computers, especially during lunch hours and after work, optimizing the use of existing technological resources. This alternative solution allowed the desired results to be achieved, ensuring significant reductions in accumulated liabilities and in the average times for reception and analysis of defense and appeal processes.

In general, the implementation of automated robots has provided significant results in the management of defenses and appeals of infractions. The average time for receiving cases was significantly reduced, falling from 30 days to just 2 working days. The location of the Traffic Infraction Notices (AIT) was largely optimized, contributing to the reduction of the liability of defenses pending analysis, which went from 60,000 to less than

25,000 cases. In the first half of 2026 alone, about 10,000 records were located for pending appeals. In terms of daily operational capacity, it is noteworthy that the AIT search and attach robot performs search in an average of 770 processes per day per machine. The robot responsible for receiving defenses via digital protocol processes approximately 270 daily processes, ensuring complete compliance with demand. The defense process assembly robot, due to possible instabilities, performs an average of 48 daily processes, requiring operation on multiple machines to increase its efficiency. As for the appeal processes, the robot that previously checks the situation of the defenses performs about 290 processes daily, while the robot that assembles these processes operates with a daily average of 150 processes, distributed in several workstations. The robot of the digital reception of the processes of the Administrative Board of Infraction Appeals (JARI) reaches a daily average of 180 processes, which fully meets current needs.

3.4 DIGITALIZATION OF PROCESSES AND CREATION OF DIGITAL CHANNELS

The digital transition promoted in the management of traffic violations was not restricted to technological modernization. It implied a structural change in the way public administration interacts with citizens and conducts its own internal flows. One of the milestones that highlighted the urgency of this transformation was the fact that, at the beginning of the current administration, the Infractions area of CET-MG was responsible for approximately 80% of the entire document volume received by the centralized protocol of the Administrative City, which concentrates the documentation destined to the State Secretariats.

This data revealed an operational overload incompatible with the logic of simplifying public services and made evident the need for a comprehensive digitalization of processes. The institutional response involved two complementary fronts: on the one hand, the digitalization of the physical liabilities accumulated over the years; on the other, the expansion and strengthening of digital entry channels, through the Traffic Services Portal.

The Superintendence of Infractions and Driver Control accumulated a voluminous collection of administrative processes in physical media — many of them requiring repetitive movements for analysis of defenses, appeals and reconstitution of driver histories. The digitization of these documents allowed them to be incorporated into the electronic system,

enabling the digital processing of historical processes by the technical team and ensuring greater transparency to citizens, who now have easy access to the information necessary to exercise their right of defense.

This digitalization was not a measure of convenience, but an essential condition for the continuity and sustainability of public traffic policy. To make it viable, an internal digitization island was created, with equipment, protocols and a team dedicated exclusively to the treatment of the collection. The operation involved rigorous flows of sorting, preparation, scanning, indexing and checking, following technical criteria that ensured integrity, traceability and compatibility with the systems already in use.

The effects of this work front were multiple: drastic reduction in the time to locate documents, with immediate access at any authorized station; document preservation, avoiding deterioration of physical originals; and ease of service to citizens, with more agile responses and elimination of dependence on paper procedures.

More than solving a historical bottleneck, the digitization of the physical collection served as a turning point in the institutional culture of CET-MG. By adopting a management logic driven by data and digital documents, teams started to operate with greater predictability, flow control, and performance evaluation capacity. This transition has set the stage for future automations, smart analytics, and more efficient and affordable public services.

At the same time, CET-MG worked on the expansion of digital channels for citizen service. At the beginning of the transition in 2023, there were some digital channels already available for citizen service, legacies of the State Department of Traffic (DETRAN-MG). These channels included the Digital Protocol, accessible through the official traffic websites and the MGapp application, allowing the submission of Fine Defenses, Infraction Appeals in the first instance and Identification of the Real Offending Driver. Initially, this digital channel communicated with the current systems, however, the documents received were printed and inserted into physical processes. Subsequently, these physical processes began to be converted into electronic processes in the Electronic Information System (SEI).

In 2023, the monthly volume of demands through digital protocol channels was approximately 966 Defenses of Fines, 193 appeals of first instance and 144 Offending Driver Identification (FICI) forms. In addition to these digital protocols, other services such as requests for copies of the infraction notice (AIT), requests for copies of defense processes, appeals, administrative suspension and cassation proceedings were carried out via e-mail. These procedures, despite being digital and eliminating the use of paper, lacked a more robust organization and did not offer adequate mechanisms for monitoring citizens, making

it difficult to control and effectively manage the requested services. Monthly email requests for copies of Infringement Defense and Appeal proceedings were less than 20, while monthly requests for copies of AIT were approximately 300.

Basic consultations related to the status of the license were also available digitally on the website, allowing citizens to check scores and possible suspension or revocation; consultation on the vehicle's situation to view pending issues, including existing infractions; and consultation of the result of the defenses and appeals, although without access to the detailed text of the judgment, only indicating the final decision.

One of the fundamental guidelines for the digital transformation of service channels was to significantly expand the use of existing digital channels, such as the Digital Protocol. To achieve this goal, several strategic actions were adopted, such as specific dissemination campaigns, streamlining digital processes, modernization and visual improvements in the layout of communications related to infractions, complete updating of the institutional website and wide dissemination through digital platforms. These initiatives resulted in a significant growth in the use of digital channels, evidenced by the 2024 data, which show a monthly average of 2,090 infraction defenses, 518 offending driver identifications, and 615 infraction appeals, representing significant increases of 116.4%, 259.7%, and 218.7%, respectively, compared to 2023. Another driving factor was the initiative of the Federal Government, which made available through the Digital Transit Card (CDT) a completely digital service for indicating offending drivers. In the first half of 2025, growth continued to rise, reaching monthly averages of 2,300 infraction defenses, 883 infraction appeals, and 808 digital driver identifications, substantially reinforcing citizens' adherence to digital channels for these specific services.

In order to improve and expand the digital channels of citizen service, ensuring greater ease, transparency and capacity to follow up on requests, the CET-MG team, in partnership with the Digital Undersecretary of the State Secretariat for Planning and Management (SEPLAG), began the development of models based on BPMS (Business Process Management Suite), the ProBPMS developed by PRODEMGE.

ProBPMS refers to a technological platform for business process management, which allows automating, managing and optimizing operational processes, offering the user a more fluid and transparent experience. With these models, citizens now have systematized and structured flows, facilitating monitoring and providing greater efficiency in the resolution of demands. 13 new ProBPMS digital protocols were developed and implemented, ensuring significant advances in digital service to the public, which are

- Request for a copy of the Infraction Notice (AIT)

- Request for a copy of the Defense or Appeals opinion
- Presentation of CETRAN Appeal (2nd Instance - infraction)
- Present a prior defense (suspension and cassation)
- Waiving the presentation of defense (suspension)
- Present JARI Appeal (1st instance suspension and cassation)
- Present CETRAN Appeal (2nd instance suspension and cassation)
- Request a copy of the CNH suspension or revocation process
- Request compliance with the penalty of suspension or revocation of the CNH

The significant increases recorded in the use of existing digital protocols demonstrate that the strategic actions of dissemination and modernization of digital channels have had a positive effect. With the implementation of these new tools and protocols developed, currently 100% of the services related to traffic violations can be accessed and fully monitored digitally through the official traffic portal of Minas Gerais. This digital transformation has not only expanded the reach and accessibility of services, but has also strengthened the transparency and operational efficiency of the State Coordination of Traffic Management (CET-MG). With this, the strategic goal of at least 50% of all demands received by CET-MG to be carried out through digital channels by the beginning of 2026 becomes increasingly tangible and close to being achieved.

3.5 NEW TOOLS AND FEATURES

In addition to the major strategic fronts developed throughout the digital transformation process, several specific initiatives and less complex projects were also implemented with significant results. These complementary projects, although simpler from a technical point of view, represented important advances in terms of agility, transparency, modernization and quality in citizen service.

Among these initiatives, the modernization of the storage of digital media of infraction notices stands out. Previously, digital files remained available in the cloud for only 90 days, and then transferred to physical CDs. With the new solution, infraction notices are now stored for up to five years in the cloud, eliminating the need for a formal request for viewing and consultation by the citizen. More than 3 thousand CDs were digitized and migrated to the cloud, promoting operational savings, practicality and instant access to content.

Another important innovation was the launch, in 2025, of the possibility of paying fines through the Pix system. The functionality was also extended to other fees, such as vehicle licensing. This made it possible, for example, for drivers approached in inspections to

regularize their situation in real time, avoiding removals and inconveniences. This measure brought direct gains to the flow of traffic and the exercise of the citizen's right to defense.

Automatic and systemic fines were also implemented, with emphasis on two: the infraction provided for in article 165-D of the Brazilian Traffic Code, referring to the failure to carry out the mandatory periodic toxicological examination by drivers licensed in categories C, D and E, and the infraction for non-compliance with the legal deadline for transfer of vehicle ownership. Both are now automatically generated by the systems, based on data crossing and verification of deadlines, ensuring greater rigor, precision and scope of inspection actions. Minas Gerais was the first state to regularly apply the toxicological assessment within the period provided for by law.

Finally, a monitoring dashboard was developed that centralizes and organizes operational data related to these new tools and flows. With a user-friendly and dynamic interface, the dashboard allows real-time monitoring of assessments, payments, automated actions and procedural demands, offering managers a strategic tool for monitoring and decision-making, in addition to strengthening the data culture and management by results at CET-MG.

All these initiatives, from the initial digitization, the centralization of processes, the change of systems and the adoption of new technologies, considered together, not only promoted operational improvements and reduction of administrative deadlines, but also brought significant gains in the quality of citizen service and public transparency. At the same time, it was possible to free up human resources previously occupied in repetitive and bureaucratic activities for strategic and analytical functions within public management, increasing the overall efficiency of CET-MG.

In terms of implications, these results confirm the importance of digital transformation in the public sector, particularly in the management of traffic violations. Technological integration and automation demonstrate clear potential for replication to other areas of state and even municipal public administration, providing a model that combines operational efficiency, transparency, and respect for citizens' rights. However, the study also identifies limitations, such as the continuous need for technological updating and permanent training of civil servants, essential factors to sustain the gains obtained and expand the benefits of this digital transformation.

4 FINAL THOUGHTS

The digital transformation experience conducted by the State Coordination of Traffic Management of Minas Gerais (CET-MG) clearly and concretely demonstrates the potential

of public innovation to reconfigure traditional processes and significantly improve the delivery of services to the citizen. From a broad process of diagnosis and redesign of operational flows, combined with the implementation of digital and automated solutions, it was possible to restructure the management of infractions in the state, overcoming historical bottlenecks and establishing a new logic of administrative action.

The adoption of automation technologies, such as the robots implemented with the support of the Automatiza.mg project, resulted in a drastic reduction in the reception and analysis times of defenses and infraction appeals — from 30 days to 2 working days — and in the elimination of liabilities that previously compromised the right of defense of drivers. The implementation of the Autua application and the subsequent adhesion to the Radar system marked a new level of digitalization in the registration and treatment of infractions, promoting gains in speed, traceability and quality of information, eliminating the use of paper, simplifying the process, cutting logistics costs and reducing errors.

Likewise, the consolidation of digital service channels and the creation of new protocols for citizens represented relevant advances in transparency, access to information, and the reduction of bureaucracy in public services. The data presented demonstrate a significant growth in the use of digital channels by citizens and reflect the direct results of the strategies for dissemination, simplification and modernization of institutional communication.

Other complementary actions, such as the digitization of the historical media of infraction notices, the launch of payment via Pix, and the automatic generation of specific infractions, have expanded the scope of the transformation and demonstrate how smaller, but well-targeted, projects also contribute to the construction of a more efficient and citizen-oriented digital ecosystem.

This journey reinforces the importance of a systemic, interinstitutional and user-centered approach so that technological innovations are in fact incorporated in a sustainable way in public administration. The advances observed at CET-MG are the result of the articulation between technical teams, public leaders and innovation support structures, such as the LAB.mg, and show that structural changes can be achieved even in the face of budgetary and operational constraints, as long as they are conducted with planning, internal protagonism and focus on results.

The experience of Minas Gerais serves, therefore, as a reference case for other federative units and public organizations that seek to combine modernization, efficiency and qualified service to the citizen. By prioritizing digital transformation as a management strategy, Minas Gerais takes a relevant step in the consolidation of more modern, responsive public policies aligned with the expectations of contemporary society.

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