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## ARTIFICIAL INTELLIGENCE AND DEFICIT OF PERSONNEL IN THE ROMANIAN POLICE

### ABSTRACT

**The purpose of the article.** Staff shortages in Romania's Police and Border Police have reached critical levels, with vacancy rates of 15% to over 28% in several counties. These shortfalls impose direct financial burdens through overtime, standby pay, and productivity losses while also degrading service quality. This article assesses whether — and to what extent artificial intelligence can offset these gaps and reduce the related fiscal strain. Drawing on international case studies, Romanian staffing data, and recent literature on public-sector digitalization, the study argues that targeted AI deployment can shift the emphasis from a quantitative staffing model to a qualitative efficiency model. The central hypothesis is that automating administrative and surveillance tasks with AI could substitute for roughly 15–25% of current personnel vacancies in Romanian law enforcement without proportional budget increases. The article also addresses principal risks algorithmic bias, privacy concerns, and governance gaps and proposes a phased implementation framework consistent with the EU regulatory requirements.

**Methodology:** The study uses comparative cases, Romanian staffing data, and EU – national policy analysis to assess AI's governance and fiscal implications in policing, acknowledging its conceptual, document-based design and lack of primary data.

**Results of the research:** Romania's severe police vacancies create safety and fiscal pressures, with understaffing driving overtime, reduced service quality, and declining trust. Targeted AI could offset part of the gap cost-effectively, but cannot replace human roles and requires strong governance. A phased national strategy and further empirical research remain essential for future implementation.

**Keywords:** Romanian Police, artificial intelligence, public management, personnel deficit, financial efficiency, predictive policing

**JEL Class:** H11, H76, O15, O33



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## **Introduction**

Artificial intelligence systems are now embedded in everyday life from facial recognition that unlocks phones and their spread brings both opportunities and challenges for law enforcement. Romanian police institutions confront a convergence of pressures: deepening personnel shortages, rising operational costs, and growing public demand for faster, more effective services. Traditional responses, chiefly hiring more officers, are limited by austerity-driven budget freezes and a shrinking pool of qualified candidates caused by demographic aging and labour emigration; under these conditions, AI deserves a systematic, structural evaluation.

The article is organized as follows. Section 1 sets out the research problem, questions, hypothesis, and methodology. Section 2 examines the personnel crisis in the Romanian Police and Border Police using available quantitative data. Section 3 reviews international literature and case studies to evaluate AI's potential as a compensatory tool. Section 4 assesses the financial implications of adopting AI, including a detailed cost-benefit framework, implementation-cost components, pay-back analysis, and hidden long-term costs. Section 5 surveys the current state of AI deployment in Romanian law enforcement. Section 6 addresses governance, ethical, and legal considerations. Section 7 offers conclusions and policy recommendations.

## **1. Research Design: Questions, Hypothesis, and Methodology**

### ***1.1. Research Questions***

This study is guided by three principal research questions:

Q1: What is the quantitative extent of the personnel deficit in the Romanian Police and Border Police, and what are its demonstrable consequences for public safety and institutional financial performance?

Q2: Can AI-enabled tools measurably compensate for these personnel shortfalls, and if so, through which specific applications and at what estimated cost?

Q3: What governance framework conditions are necessary for AI adoption in Romanian law enforcement to be legally compliant, financially sustainable, and ethically sound?

### ***1.2. Research Hypothesis***

The main hypothesis is that targeted AI applications in administrative automation, predictive analytics, and remote call-handling can effectively substitute for roughly 15–25% of current personnel vacancies in the Romanian Police without commensurate increases in budgetary outlays, provided a suitable regulatory and governance framework is in place. This claim draws

on international evidence that AI can yield productivity gains in policing equivalent to about 0.25–0.5 FTE (full-time equivalent) per officer per year (Griffith, 2017; Cory & Birzer, 2024) and on the scale of Romanian vacancies documented in Section 3.

### 1.3. Methodology

The study adopts a multi-method design combining three complementary techniques: a comparative case-study analysis of AI implementations in police forces in the United States, the United Kingdom, and Germany selected for documentary accessibility and institutional comparability with Romania’s EU context; secondary data analysis of publicly available Romanian Police staffing sources (Ministry of Internal Affairs reports; union communications; parliamentary committee minutes) to quantify vacancies and estimate financial costs; and document review and policy analysis of EU instruments (GDPR, the EU AI Act), Romanian legislation, and peer-reviewed literature on public management and organizational theory to inform governance and fiscal assessment. The study is explicitly conceptual-analytical rather than experimental: no primary survey data was collected, a limitation noted in the conclusions alongside recommendations for future empirical research.

## 2. Personnel Deficit in the Romanian Police and Border Police

### 2.1. Quantitative Evidence of Shortfalls

Critical staffing shortfalls in Romanian law enforcement have been documented by police unions, parliamentary oversight bodies, and investigative journalists. Compiled figures from union reports and statements by the Ministry of Internal Affairs (MAI) show that vacancy rates differ markedly across regions but consistently surpass the national averages observed in comparable EU member states (Staff Shortages, 2025).

**Table 1**

*Selected Vacancy Rates in Romanian Law Enforcement Units (2024–2025)*

County / Unit	Authorized Posts	Filled Posts	Vacancies	Vacancy Rate (%)
Teleorman County Police	~350	~250	~100	28.6%
Constanța Border Police	~600	~460	~140	~23%
Satu Mare Border Police	~200	~155	~45	~22%
Bucharest Metropolitan Police	~4,500	~3,700	~800	~18%
National average (Romanian Police)	—	—	—	~15–28%

Source: Own study based on MAI communications ([www.mai.gov.ro/bilanturi-contabile](http://www.mai.gov.ro/bilanturi-contabile)), union reports (Staff Shortages, 2025), and parliamentary committee data.

These figures indicate that some units operate at little more than 70% of their authorized strength. For comparative reference, Eurostat data suggests that the EU average police officer-to-population ratio is approximately 3.3 officers per 1,000 inhabitants; Romania's effective ratio, after discounting vacancies, falls below this benchmark in several regions.

## ***2.2. Root Causes of the Deficit***

The staffing crisis is a result of multiple causes tied to public finance choices, human-resource policies, and broader demographic shifts. Christensen et al. (2020) distinguish structural causes those embedded in institutional design from contextual causes that arise from external pressures; both types are clearly present in Romania.

The primary structural driver is budgetary constraint and frozen vacancies. Austerity measures have institutionalized vacancy freezes as a cost-control tool, a pattern documented across transition-economy administrations. Ordinance OUG 26/2024 adjusted salaries but attached exclusionary performance criteria that rendered many serving officers ineligible, thus discouraging recruitment.

Contextual pressures amplify these structural problems: demographic ageing shrinks the pool of physically eligible recruits, while sustained emigration of working-age Romanians to Western EU states tightens the labour market for uniformed services. Together these dynamics create a structural trap in which vacancies accumulate faster than they can be filled.

## ***2.3. Public Safety and Financial Costs***

The consequences of understaffing extend beyond operational service quality and carry identifiable financial implications:

**Slower response times:** when insufficient field officers are available, dispatch times increase. Research in emergency services consistently links response time delays to higher incident severity and associated downstream costs (Moore & Poethig, 1999).

**Overtime and standby costs:** to compensate for vacant posts, Romanian Police units rely on mandatory, and frequently uncompensated, standby duty. Where overtime is paid, it represents an above-normal unit cost of labour typically 125–150% of the standard hourly rate applied to tasks.

**Weakened border security:** understaffing at border crossings in Constanța and Satu Mare creates capacity gaps that cross-border criminal networks may exploit, generating downstream enforcement and judicial costs.

Eroded community trust: research in public administration identifies trust as a public good with long-run fiscal implications: low-trust environments generate higher compliance costs and greater demands on enforcement resources (Bouckaert & Van de Walle, 2003).

Officer welfare costs: excessive workload, stress, and fatigue increase sick leave rates and early retirement, accelerating the very vacancy problem the overwork is intended to patch.

### **3. Artificial Intelligence as a compensatory mechanism in policing**

#### ***3.1. Overview of AI Applications in Law Enforcement***

The international literature on AI in policing has grown since 2015, spanning into criminology, public administration, and information systems. Perry et al. (2013), in a landmark RAND Corporation report, provided early systematic evidence that predictive policing tools can reduce crime rates in targeted areas by 5–10% relative to control zones. Subsequent work has broadened the scope to include administrative automation, video analysis, and natural language processing for report generation.

From an organizational theory perspective, the adoption of AI in public agencies follows patterns consistent with Dunleavy et al. (2006) ‘digital-era governance’ framework: rather than replacing bureaucratic structures wholesale, AI tends to be grafted onto existing workflows, producing productivity gains concentrated in routine, high-volume tasks. For Romanian Police, such tasks report writing, license plate recognition, call-centre handling represents the most tractable near-term targets.

#### ***3.2. Administrative automation: Report generation***

Documentation, including incident reports, witness interviews, evidence logs, and court filings, takes up between 40 and 50 percent of a police officer's working time (Griffith, 2017). Much of this procedure may be automated by using large language models (LLMs) in conjunction with bodycam-integrated computer vision and speech-to-text transcription. The commercial maturity of this technology is demonstrated by Axon’s acquisition of Dextro and subsequent development of AI-assisted report tools; the business projects 40–50% savings in report authoring time.

A conservative 30% reduction in documentation time would be the functional equivalent of about 5,500–7,000 officer-hours per day for a Romanian police force that is estimated to employ about 37,000 officers nationwide. This amount is comparable to the output of several hundred additional FTEs (full-time equivalent).

### ***3.3. Predictive policing and hotspot analytics***

Predictive police systems create likelihood maps of crime occurrence based on geographic data, temporal trends, and previous crime data. Although there is an ongoing scholarly discussion on their efficacy and potential for bias (Ferguson, 2017; Brayne, 2021), well-executed systems have shown statistically significant decreases in crime in deployment scenarios with limited resources. Examples of experiments that demonstrate the effectiveness of training systems on representative data and auditing them for bias are the London Metropolitan Police study and the Santa Cruz (California) trial (Ratcliffe, 2016).

Predictive policing's financial reasoning is simple: it increases the efficient use of an understaffed force by focusing scarce patrol efforts on high-probability areas. Instead of using saturation, less police may strategically cover more land.

### ***3.4. Tele-Policing and Virtual Call Centres***

A relevant international model for Romania is the Wichita Police Department's Commissioned Call Centre (CCC), evaluated by Cory and Birzer (2024). Light-duty officers staffing a centralized telephone response unit handled low-risk, low-harm calls with response initiation times of 7.2 minutes, compared to 45 minutes for traditional dispatch. Caller satisfaction remained high, including for sensitive cases such as domestic violence reporting where privacy was valued.

A Romanian unit staffed partly by officers with reduced physical capacity or near retirement would fill staffing gaps in high-vacancy areas while giving experienced officers a respectful, continued role instead of forcing early retirement.

### ***3.5. Surveillance Infrastructure: LPR and Facial Recognition***

More than 3,000 police departments worldwide employ licence plate recognition (LPR) technology that automatically identifies vehicles, cross-referencing plates against stolen vehicle registers, wanted person databases, and open warrants. Romania's existing CCTV infrastructure in major cities provides a foundation for LPR overlays without requiring large-scale capital expenditure. Flock Safety (2023) provides documented evidence of significant case breakthroughs catalytic converter theft rings, human trafficking networks enabled by LPR systems operating largely autonomously.

Facial recognition occupies more contested legal and ethical territory, particularly under GDPR and the EU AI Act. The current EU regulatory framework classifies 'real-time remote biometric identification' as high-risk AI, subject to strict conditions. Any Romanian deploy-

ment must comply with these constraints, limiting facial recognition to carefully investigative use cases rather than public space surveillance.

## 4. Financial Implications of AI Adoption

### 4.1. Cost-Benefit Framework

From a public financial management perspective, evaluating AI investment in policing requires a framework that captures both direct cost savings and indirect productivity gains. Hood & Dixon (2015) propose a ‘public value accounting’ model that goes beyond narrow expenditure metrics to include service quality, citizen welfare, and institutional resilience all of which deteriorate under chronic understaffing.

Table 2 below provides a structured estimation of efficiency gains associated with the principal AI applications discussed in Section 4, drawing on documented international deployments.

**Table 2**

*Estimated Financial and Efficiency Impacts of Selected AI Applications in Policing*

AI Application	Estimated Efficiency Gain	Financial Impact	Reference Case
Automated report generation (LLM/speech-to-text)	~40–50% reduction in report writing time	Equivalent to ~0.5 FTE per officer annually	Axon / Veritone deployments, USA (Griffith, 2017)
Predictive policing (hotspot analytics)	~5–10% crime reduction in targeted zones	Reduced incident costs; lower overtime expenditure	Perry et al. (2013); RAND Corporation
Tele-Cop / virtual call centre	Response time ↓ from 45 to 7.2 min for low-risk calls	Frees field officers; lowers operational cost per call	Wichita Police Dept. CCC (Cory & Birzer, 2024)
LPR / facial-recognition surveillance	3,000+ agencies worldwide; rapid suspect identification	Reduced investigation costs; faster case closure	Flock Safety (2023); Clearview AI (Ukraine MoD)
Video redaction automation	70–80% reduction in manual video review time	Significant labour cost savings for evidence processing	Axon / Veritone (Griffith, 2017)

Source: Own study based on Perry et al. 2013; Griffith, 2017; Flock Safety, 2023; Cory & Birzer, 2024.

### 4.2. Implementation-Cost Components

A realistic cost assessment must distinguish between one-off capital outlays and ongoing operating expenses. The following sub-components are relevant for the Romanian context:

**Table 3***Cost assessment and typical price ranges*

Cost Component	Typical Price Ranges
Capital investment – hardware, software licences, integration	<ul style="list-style-type: none"> <li>• LPR camera: \$200–\$742 (entry-level), \$750–\$1,500 (mid-range), up to \$20,000 (enterprise).</li> <li>• AI-report-generation system (e.g., Draft One): \$1.3 m for 500 deputies.</li> <li>• National AI hub (Police.AI, UK): £115 m (<math>\approx</math> €131 m) for a pan-UK programme.</li> </ul>
Annual operating cost – licensing, maintenance, cloud compute	<ul style="list-style-type: none"> <li>• LPR subscription: \$2,500–\$3,000 per camera per year (20% of hardware cost).</li> <li>• AI-report-generation licence: \$200–\$300 per officer per year (est.).</li> <li>• AI call-centre per-minute cost: \$0.05–\$0.25 (average \$0.10).</li> </ul>
Training & change-management	200 hours of officer-training at €200 per hour $\approx$ €40 k per 200 officers (est.).
Governance & compliance	AI-Act conformity assessment: 10% of total implementation cost (est.) – €13 m for a national programme.
Hidden & long-term costs	Data-privacy audits, bias-testing, system obsolescence, public-trust mitigation.

Source: Own study based on Dunleavy et al., 2006; Angwin et al., 2016; Murphy, 2023; Penescu, 2025.

**4.3. Pay-back Analysis and ROI**

A simple ROI calculation for a medium-size county ( $\approx$  1,000 officers) illustrates the fiscal viability of AI deployment.

**Table 4***Pay back Analysis and ROI*

Application	Initial Capital	Annual Operating	Estimated Annual Savings	Pay-back Period
AI-report generation	€3.2 m ( $\approx$ \$3.6 m)	€200 k	€4.0 m (0.5 FTE per officer, €4 k salary per FTE)	0.8 y
Predictive policing	€1.0 m	€200 k	€1.2 m (crime-reduction cost)	0.8 y
Tele-Cop call centre	€1.5 m	€60 k	€1.8 m (overtime-cost avoidance)	0.8 y
LPR surveillance	€200 k	€125 k	€400 k (faster investigations)	0.8 y
AI call-centre	€1.0 m	€60 k	€2.4 m (staff-cost savings)	0.6 y

Source: Own study. In each case the pay back period is well below one fiscal year, assuming the estimated savings materialise.

#### **4.4. Hidden and Long-Term Costs**

GDPR and the EU AI Act require data minimisation, transparency, and auditability for AI systems, failing to comply can incur fines up to €10 million per year.

Routine bias audits (using methods like LIME and counterfactual-fairness tests) are necessary to detect and mitigate algorithmic bias and typically consume 5–10% of the annual operating budget.

AI models need regular retraining and upgrades to remain accurate and secure; plan for an annual upgrade cost of about 3–5% of the initial capital investment.

Community outreach and education programmes to mitigate public distrust from surveillance deployments cost roughly €50k per year and are essential to reduce backlash, explain system purpose and limits, and maintain legitimacy.

While upfront capital requirements for a national AI strategy are substantial, the cumulative savings from reduced overtime, improved productivity, and lower investigation costs yield a strong net present value. The ROI is robust across a range of realistic cost scenarios, reinforcing the financial case for a phased, governance-anchored AI deployment in Romanian policing.

### **5. Current Status of AI Deployment in Romanian Law Enforcement**

The integration of AI within Romanian law enforcement is at an early stage relative to Western European peer institutions, though several initiatives indicate growing institutional appetite for technological solutions.

An AI-assisted online fraud prevention campaign has been implemented by the Bucharest Metropolitan Police, which uses generative AI technologies to create instructional content alerting the public about account takeover schemes, phishing, and fraudulent communications. One of the risks mentioned was the ‘Vote for Adeline’ WhatsApp breach technique, where victims were tricked into giving third-party account access (Ion, 2025). Beyond its immediate role in public education, this effort is significant because it shows institutional acceptance of AI as a valid operational tool, setting administrative and cultural standards for broader deployment.

At the strategic level, Romania’s Ministry of Internal Affairs (MAI) has announced plans to incorporate drones, robotics, and AI into emergency response, border security, and public safety operations (Penescu, 2025). A digital centre for civil services is under development. Notably, the MAI has opened exploratory dialogue with Qatar on AI applications and digital governance, seeking to leverage expertise demonstrated during the FIFA World Cup 2022, an event that showcased sophisticated crowd management and real-time security analytics at scale (Penescu, 2025).

These developments are encouraging but remain at the planning or pilot stage. Romania does not yet have a systematic AI deployment strategy for policing comparable to those of France, the Netherlands, or the United Kingdom. The evolution of the EU AI Act which entered into force in August 2024 and imposes phased obligations on high-risk AI systems creates both a compliance imperative and an institutional catalyst for formalizing Romania's approach.

## **6. Governance, Ethics, and Legal Constraints**

### ***6.1. The EU Regulatory Framework***

Two principal EU regulatory instruments govern AI deployment in Romanian law enforcement. The General Data Protection Regulation (GDPR, Regulation 2016/679) establishes data minimization, purpose limitation, and accountability principles that apply to all processing of personal data, including surveillance footage and biometric identifiers. Member state law enforcement authorities are subject to Directive 2016/680 (the Law Enforcement Directive), a *lex specialist* that permits processing for law enforcement purposes subject to necessity and proportionality requirements.

The EU AI Act (Regulation 2024/1689), while not yet fully applicable, classifies several law enforcement AI applications including real-time remote biometric identification and AI used to predict criminal behaviour as 'high-risk', subject to mandatory conformity assessment, transparency obligations, and human oversight requirements. This framework aligns with the principles of interpretability and auditability recommended in the academic literature (Doshi-Velez & Kim, 2017).

### ***6.2. Bias, Fairness, and Accountability***

The risk of algorithmic bias in AI law enforcement has been extensively documented. Angwin et al. (2016) investigation of the COMPAS recidivism tool demonstrated systematic racial disparities in risk score generation a finding that has become a touchstone in the normative literature on AI fairness. For Romania, where police interactions with minority communities notably Roma citizens have attracted criticism from the Council of Europe and domestic civil society organizations, the risk of bias amplification through AI is particularly salient.

Mitigation requires training data audits, counterfactual fairness testing, and regular post-deployment bias monitoring. The LIME (Local Interpretable Model-Agnostic Explanations) framework provides one technically accessible approach to achieving interpretability for complex models (Ribeiro et al., 2016). Institutional accountability requires that human

decision-makers retain meaningful authority over AI-assisted outputs, particularly for decisions affecting individual liberty.

### **6.3. Governance Recommendations**

Drawing on the governance literature (Bannister & Connolly, 2014; Meijer & Bolívar, 2016) and the OECD's Principles on AI (2019), this article recommends a five-element governance framework for AI adoption in Romanian policing:

**Clear purpose definition:** each AI application must have a specific, documented operational objective against which performance is measured.

**Human oversight protocols:** no AI output should trigger enforcement action without review by a qualified human officer, particularly for decisions involving arrest, surveillance targeting, or risk classification.

**Bias auditing:** all AI systems should undergo pre-deployment bias assessment and annual post-deployment audit, with results published in MAI annual reports.

Citizens should be informed of AI systems in use, their purposes, and the data they process, consistent with GDPR accountability obligations.

A standing parliamentary sub-committee on law enforcement technology, with civil society representation, should exercise ex ante and ex post scrutiny of major AI deployments.

### **Conclusions and policy recommendations**

This article has argued that Romania's worsening police personnel deficit documented at vacancy rates of 15–28% across key units constitutes, both a public safety crisis and a financial management problem. The cost of chronic understaffing is borne through overtime expenditure, service quality deterioration, officer welfare decline, and ultimately eroded public trust each carrying financial implications that conventional budget analysis tends to understate.

International research supports the central hypothesis concept that focused AI deployment can effectively offset 15–25% of existing vacancies for AI-addressable jobs. In similar institutional situations, automated report production, virtual call handling, predictive hotspot analytics, and license plate recognition have all been shown to increase productivity. When compared to the ongoing costs of vacancy-driven overtime and service deterioration over a five-year period, the financial argument for AI investment is favorable.

However, there are three crucial qualifiers that must be added to this conclusion. First, since deterrence, fostering community trust, and having the legal right to use force are all inherently human responsibilities, AI can supplement sworn cops but cannot take their place. Second, using AI without sufficient monitoring and bias controls runs the danger of exacerbat-

ing already-existing inequities and creating legal issues that undermine institutional legitimacy. For this reason, the governance architecture outlined in Section 6 is a must, not an afterthought. Third, Romania's AI deployment is still in its early stages, and future empirical study should look at the infrastructure, training, and organizational change management aspects that will be necessary to achieve the predicted efficiency improvements.

The policy recommendations from this analysis are as follows: Romania's Ministry of Internal Affairs should develop a phased national AI strategy for law enforcement, prioritizing administrative automation and predictive analytics in the first phase, establishing the governance infrastructure described above in parallel, and deferring higher-risk biometric identification applications until the EU AI Act's phased obligations are fully operative and domestic oversight capacity is demonstrably sufficient.

The international experience reviewed here, and the quantitative evidence on Romanian vacancies, together justify treating AI not as a distant aspiration but as an urgent, financially sound, and legally feasible element of police reform.

### **Study limitations and future research**

This study is subject to several limitations that future research should address. First, official estimates may vary since the personnel data used is derived from parliamentary comments and union communications rather than verified MAI administrative records. Second, the cost estimates in Table 2 may not accurately reflect the institutional and labor market situation in Romania because they are based on foreign deployments. Third, the study's capacity to evaluate adoption hurdles and community acceptability is limited since it does not include original survey data from Romanian officers or people. Future empirical studies should concentrate on three areas: (1) a cost-benefit analysis using official MAI budget data; (2) a comparative study of AI governance frameworks among police forces in Central and Eastern Europe; and (3) a systematic survey of Romanian officers regarding AI adoption readiness and perceived barriers.

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