Mühlbauer
High Tech International

# MÜHLBAUER TECURITY®
## GOVERNMENT SOLUTIONS

# CONTENTS

# COMPANY

# MÜHLBAUER GROUP AT A GLANCE

Founded in 1981 in the heart of Bavaria, the Mühlbauer Group has ever since grown to a leading global player in the fields of Parts & Systems, Semiconductor Related Products, Document Solution Related Products and TECURITY® Solutions. With around 3,500 employees, technology centers in Germany, Malaysia, Slovakia, the U.S. and Serbia, and 35 sales and service locations worldwide, Mühlbauer created a strong competence network around the globe.
We continuously invest in the latest technologies and innovative processes to enhance our competences and to provide you with optimized solutions. Our in-house precision part production – MPS – Mühlbauer Parts & Systems – guarantees unlimited flexibility and highest customer satisfaction.

Our business unit AUTOMATION does not only develop and assemble individually customized production systems, but also provides matching software solutions for the production process of Document and Solution Related Products. Vision inspection technologies as well as semiconductor and RFID applications complete our comprehensive portfolio.
Our business unit TECURITY® is established as a competent partner for the implementation of security systems for identifying and verifying both documents and individuals. Our clients benefit from more than three decades experiential value which we have gained during the realization of over 300 ID projects worldwide.


Mühlbauer Bosnia & Herzegovina
Mühlbauer China
Mühlbauer Germany
Mühlbauer Malaysia
Mühlbauer Serbia
Mühlbauer Slovakia
Mühlbauer USA

**MPS**
Precision Parts & Surface Engineering

**AUTOMATION**
Production Equipments & Systems

**World of TECURITY®**
Government & Technology Solutions

# MÜHLBAUER HISTORY

**1981**
Founding of the company by Josef Mühlbauer with only one machine for the production of precision parts

**1985**
Development of production equipment for the semiconductor backend industry

**1988**
First turnkey production solutions for the manufacturing of plastic cards and smart cards

**1991**
Opening of first sites abroad

**1995**
Development of the RFID factory

**1998**
Initial public offering of the company

**2003**
Positioning in the areas of government security & biometry

**2008**
Installation of the first fully-automatic production facilities for flexible thin film solar technology

**2014**
Opening of the Mühlbauer TECURITY® Center in Roding, Germany

**2016**
Expansion of the Technology Center in Nitra, Slovakia

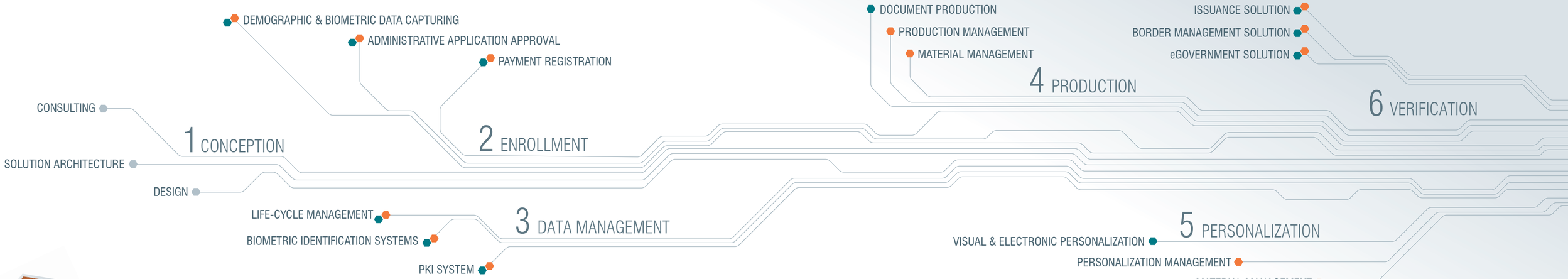
**2017**
Mühlbauer launches MB PALAMAX® production platform

**2018**
Opening of the Technology Center in Newport News, USA

**2019**
25 years Muhlbauer Inc.

# PROCESS

# PROCESS OVERVIEW



# CONCEPTION

Comprehensive planning is the key to every successful project. The client's individual requirements combined with our extensive know-how determine the outline of the solution's architecture. After extensive consultation, we develop a detailed project plan which includes every step of the process – from the design to the issuance and the verification of the personalized documents. Furthermore, the hardware and software infrastructure, the administration and logistics, the cooperation with local suppliers and staff, as well as further service and maintenance options are all essential subdivisions which have to be taken into consideration.

Not only the detailed security concept, which determines the document's design and the security features applied, is of particular importance, but also the project's infrastructure and networks according to the latest security standards. Our specialists from a variety of departments cooperate closely. They accompany the project right from the beginning and thus ensure an efficient and reliable planning so that the optimal customized solution is achieved.

# ENROLLMENT

Every human being is unique. An individual's biometric combination is defined by 260 individual optical characteristics of the iris, the pattern and minutiae features of the fingerprint and a multitude of different attributes of the personal signature. The use of this biometric data has made it possible to identify and verify any arbitrary person. The enrollment process of sensitive data requires comprehensive know-how and upmost care to ensure that the collected data serves the project's requirements.

The flexible design of the Mühlbauer GET-ID systems allows for the provision of customized enrollment. Data can be captured by form or live, in a centralized or decentralized enrollment-station, depending on the project's structure. A set of functions manages the capturing of the applicant's documents, the separate approval steps, as well as the payment process. Irrespective of the form the client chooses, data security is preserved at any time while capturing the individual's personal attributes.

# DATA MANAGEMENT

Personal data is one of the most valuable goods. Since the use of personal and biometric attributes for any form of identification or verification has become increasingly common, secure management and processing of the captured data is crucial. In order to ensure the optimal handling of the enrolled and verified datasets throughout any part of the application and document lifecycle, we have established our most effective software infrastructure and solutions.

The identification process is supported by a standardized interface to the biometric identification and verification system comprising fingerprint (AFIS), iris (IRS) and face recognition (FRS) and thus enabling highest interoperability with any sensor technology in the market. Most importantly, our data management structure sets highest security standards by using the latest encryption technologies. It reliably protects the datasets from any form of abuse, counterfeit or even identity theft.

# PRODUCTION

The complexity of ID documents constantly increases. Growing security needs as well as organized document fraud demand the continuous enhancement of secure documents. As one of only a few chosen companies worldwide, we are certified as security printer and security supplier by INTERGRAF and consequently hold significant expertise in the development of customized ID solutions. Our document and forensic specialists create documents which are fully equipped for future demands. They commence with comprehensive consulting to define the document solution design, but also take into consideration all the prospective requirements. Working with equipment generated by ourselves, we continuously monitor and enhance the quality and security features of our products. Additionally, we have developed high-end materials which merge all the advantages of document production and personalization with document security. Our core competence is to provide our customers with optimized solutions and documents that are perfectly protected from manipulation and fraud. As regards the production process of ID documents, MB PALAMAX®, our in-house Smart Factory Production & Process Management Software, allows for the collection of complete real-time production data. MB PALAMAX® enables total transparency of the production process. It provides an interface for process monitoring and statistical analysis of the production process. Thus, it supports the production planning to optimize and control the cost drivers during the production process. MB INCAPE is Mühlbauer's proven software solution for the management of production processes for ID documents. It covers the complete organization of production, job, data and material handling. With MB PALAMAX® and MB INCAPE, Mühlbauer has laid the groundwork for a comprehensive Manufacturing Execution System (MB MES), which takes manufacturing execution to the next level.

# PERSONALIZATION

A personalized ID document is the key to identify an individual. By transferring both the personal and the biometric data to the blank document, the ID card, the passport or the license becomes unique. This is the only way to achieve a reliable verification.

Depending on the individual requirements, a comprehensive portfolio of the latest technologies, including high-end printing, laser engraving and lamination systems, guarantees the efficient application of the visible attributes on the medium's surface. The personal and biometric data's secure and encrypted transfer to the embedded storage chip is supported by a production management solution with interfaces to the latest Public Key Infrastructure (PKI) and background systems. During the personalization process, all material movements are controlled by large material management systems. Constant and thorough quality checks ensure the complete and correct registration of the prepared datasets, thus making sure that only authenticated data is transferred from the central database. With regard to your personalized documents, we are committed to the highest international security standards.

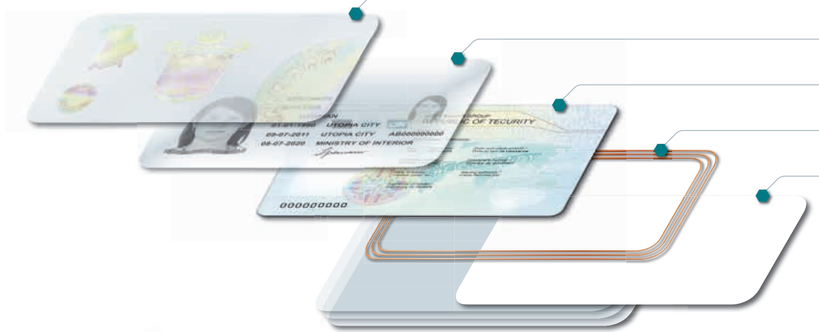
# VERIFICATION

International traveler volumes rise on a daily basis. A multiplication of airport arrivals and departures, illegal migration and organized crime leads to greater challenges in the globalized world. Reliable verification systems become essential to cope with these trends. Our innovative access and border control solutions offer the highest level of security and accuracy with regard to the identification of the individual and the verification of the personal data which are captured by means of MB ABIS (Automated Biometric Identification System). Latest security standards apply to the verification of ID documents before sensors capture the biometric attributes. Then they are matched with the datasets which have been identified with Mühlbauer's modular and scalable enrollment platform MB GET-ID in advance. The highly fle-xible system design allows for a tailor-made solution according to the client's requirements. It combines different types of fingerprint sensors, face or iris cameras. Automatic quality assessments guarantee maximum matching accuracy in our solutions so that national interests are preserved and overall security is increased.

By means of standard mobile devices such as smartphones or tablets, our new mobile application, MB STEEL READER MOBILE, even allows for a secure mobile verification of the passenger's travel document at any time and in any place.

# SOLUTIONS

# ID CARD SOLUTION



**OVERLAY**

**PERSONALIZATION OVERLAY**

**OFFSET OVERLAY**

**RFID ANTENNA**

**WHITECORE**

We excel in providing innovative ID card solutions. Customized design, security elements meeting the latest standards, constant enhancements and in-house developed high-end materials and technologies guarantee the production of optimized, highly durable and unforgeable documents.

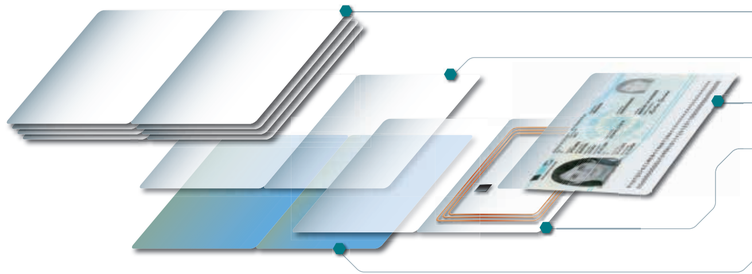

The customized design of our solution allows for the setup of an individual infrastructure for the personalization and issuance of ID cards. A decentralized enrollment of the applicant's data followed by the data management at a central site enables the most flexible and efficient process handling. Afterwards, the blank document is personalized in a decentralized location so that the finished ID card can be issued locally. Decentralized enrollment and issuance simplifies not only the access to ID documents for the whole population, but also the complete capturing of the citizens' data.

ID Card Republic of El Salvador

eID Card Gibraltar

Residence Card Georgia

# ePASSPORT SOLUTION



**VISA PAGES**

**FLYLEAF PAGES**

**FLEXIBLE PC HOLDERPAGE**

**INLAY WITH CHIP**

**COVER**

Patented production technologies, in-house developed materials, high-quality personalization techniques, customized security features, as well as our unique hinge technology form the key elements of our ePassport solutions. In compliance with our customers' individual requirements, we provide high-end solutions for fraud-resistant documents.


Paper Holderpage
Republic of the Congo

ePassport
Republic of Tajikistan



ePassports
Bosnia & Herzegovina

Our flexible solutions enable the secure issuance of citizens' ePassports worldwide. Embassies abroad act as decentralized enrollment sites which are connected to the high-secure data infrastructure. The enrolled datasets are securely transferred to the central data management site in the home country for registration and further processing. Before the ePassports are issued at the respective embassies, production and personalization are carried out in a centralized location. We also guarantee highest flexibility for the citizens living abroad applying for ePassports and for the replacement of traveler documents in foreign countries.

# VERIFICATION SOLUTION

## FACE

Face recognition systems use facial biometrics in order to identify an individual. Verification is achieved by means of cameras which capture the facial attributes before the MB FRS (Face Recognition System) automatically matches the biometrics with the enrolled dataset.

## IRIS

Staying almost unaltered for a lifetime, the human iris serves as an individual's most reliable verification feature. During the verification process, recognition sensors supported by MB IRS (Iris Recognition System) take pictures of the iris and automatically match them with the data stored in the embedded chip.

## FINGERPRINT

The individual fingerprint is defined by unique patterns. The flexible MB AFIS (Automated Fingerprint Information System) reliably supports any sensor on the market. It captures and matches various forms of fingerprints, ranging from the verification of just one fingerprint up to the verification of both hands at the same time.


We provide you with comprehensive turnkey solutions for the efficient and reliable verification of documents and travelers at governmental borders. Individually configured Automated Border Control systems ensure the efficient handling of passengers within seconds. They verify the validity of the ID document, match the enrolled personal and biometric data with the life data and even check them for alert list entries. Additionally, mobile devices and MB GET-ID MOBILE systems are used for the flexible verification of the individual.

MB FAST GATE SERIES

MB STEEL READER

MB GET-ID MOBILE

# DRIVER'S LICENSE & VEHICLE REGISTRATION SOLUTION



## WINDSHIELD STICKER

The RFID tag holds a chip with a unique, unforgeable serial number. Upon removal, the tag is destroyed and thus made secure against theft. When reading the chip with a RFID device, the serial number is matched with the central database, thus ensuring the reliable identification of the vehicle holder by authorized personnel only.


## LICENSE PLATE

A unique number is assigned to a vehicle enabling the definite identification of its holder. The license plates are read out by cameras or, if equipped with a chip, by RFID devices and matched with the information in the central database. Apart from the verification of the vehicle owner, the system also enables tax and insurance data checks, and even speed and access control.

## DRIVER'S LICENSE

The driver's license holds all necessary information about the vehicles drivers are allowed to operate and if there are any further constraints to their driving abilities. In order to render the document unforgeable, high-end security elements and technical features are applied according to the customers' individual requirements.


Driver's License Bosnia & Herzegovina

## VEHICLE LICENSE

The high-end, fraud-resistant license contains all the data of the owner and the vehicle's technical specifications, thus ensuring the reliable identification of any vehicle liable to registration. The customized document is designed according to the latest security standards. It can optionally be equipped with an embedded chip for an even more simplified verification process.


Vehicle License Georgia

We excel in providing complete vehicle registration and license solutions. Our customized infrastructure network enables a reliable identification and verification of drivers, vehicles and their holders. Supported by our cutting-edge smart card and RFID technologies and data management systems, high-volume verification can efficiently be carried out. By matching visible attributes and enrolled data with the central database, stationary and mobile devices ensure comprehensive traffic control throughout the complete road network.

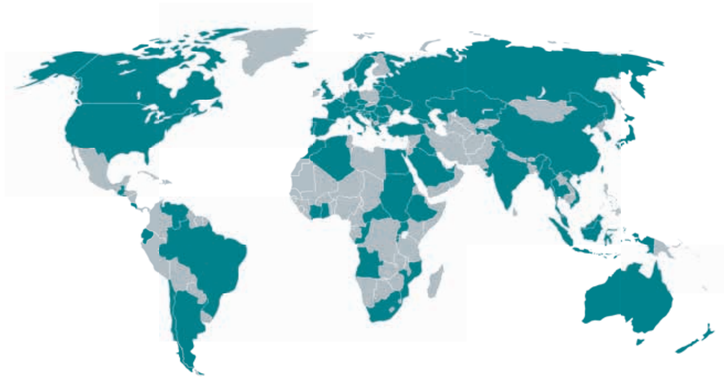
Driver's License Georgia – Front

Driver's License Georgia – Back

Vehicle Registration Iraq – Front

Vehicle Registration Iraq – Back

# REFERENCES



# GLOBAL REFERENCES

## 300 ID PROJECTS WORLDWIDE

As one of the world's leading single-source providers of innovative and high-end security solutions, we are currently involved in more than 300 ID projects worldwide. Our successful projects range from basic solutions up to the most complex BOT-projects (Build-Operate-Transfer), including the development of a multitude of documents, vast hardware and software infrastructure measures, comprehensive trainings, as well as extensive service.
With the successful completion of numerous projects, we have developed decisive know-how and experience in defining and implementing tailor-made solutions that meet our clients' individual requirements. We do not only deliver the customized high-end systems. More importantly, we also accompany our clients before, during and after the project. We are proud to support various nations on all five continents to further enhance their security infrastructure.

# KEY REFERENCES

**PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA**
National ID Card, Driver's License & Vehicle Registration

**REPUBLIC OF ANGOLA**
Civil Registry

**COMMONWEALTH OF AUSTRALIA**
ePassport Personalization

**BOSNIA & HERZEGOVINA**
Driver's License, National ID Card & ePassport

**REPUBLIC OF CHAD**
National ID Card, Residence Card & ePassport

**REPUBLIC OF THE CONGO**
National ID Card, ePassport & Tax ID Card

**REPUBLIC OF EL SALVADOR**
National ID Card

**REPUBLIC OF FIJI**
ePassport

**GEORGIA**
National ID Card & eGate

**REPUBLIC OF GHANA**
Enrollment & ePassport Personalization

**GIBRALTAR**
National ID Card & Driver's License

**REPUBLIC OF GUATEMALA**
National ID Card

**REPUBLIC OF INDONESIA**
National ID Card

**REPUBLIC OF IRAQ**
Driver's License & Vehicle Registration

**ITALIAN REPUBLIC**
Driver's License

**STATE OF KUWAIT**
ePassport Personalization

**REPUBLIC OF MOLDOVA**
eGate

**MONTENEGRO**
National eID Card, ePassport, Driver's License, Multi-Purpose cards

**REPUBLIC OF MOZAMBIQUE**
National ID Card & ePassport

**SULTANATE OF OMAN**
eGate

**REPUBLIC OF SERBIA**
eGate

**REPUBLIC OF SOUTH AFRICA**
Enrollment for Driver's License

**REPUBLIC OF SOUTH SUDAN**
National ID Card, ePassport & Vehicle Registration

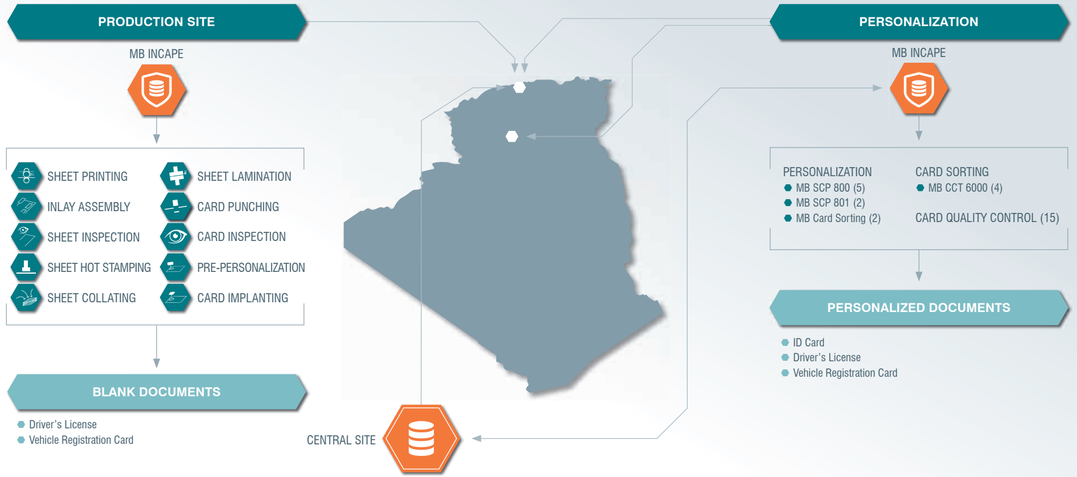
**SWISS CONFEDERATION**
Military ID Card

**REPUBLIC OF UGANDA**
National ID Card – NSIS

# PEOPLE‘S DEMOCRATIC REPUBLIC OF ALGERIA

## NATIONAL ID CARD, DRIVER‘S LICENSE & VEHICLE REGISTRATION

The ID card personalization project of Algeria was awarded by the Ministry of the Interior and of Local Authorities and started in August 2015. Mühlbauer closely cooperated with the Ministry to deliver card personalization equipment and a production and personalization management system for two personalization centers in Algiers and Laghouat. The centers have been equipped to personalize the new Algerian ID Card by laser engraving (image and personal data of the card holder) and chip encoding on a hybrid card. To interconnect the production and personalization management with the existing infrastructure and to ensure a smooth implementation, Mühlbauer coordinated with local partners. During the first year of operation, Mühlbauer provided supervision staff at site to support the ramp-up. Moreover, the local staff received a comprehensive training on the systems, in order to guarantee the facility’s efficient operation. After the successful completion of the first project, Mühlbauer was engaged for a follow-up project in 2016: the delivery of a complete Smart Card factory for the production and personalization of up to 5 million national driver’s licenses and vehicle registration cards per year. The project included the delivery and setup of the complete plant, the development of a security concept, the systems for card body production, laser pre-personalization, inspection and personalization with the MB ALFRESCO® technology, as well as the installation of the proven production and personalization management system MB INCAPE. Besides, a comprehensive service package was included: customer staff received an all-inclusive training and Mühlbauer delivered the know-how transfer to enable the smooth operation after hand-over, including the new production unit DIN ISO certification.




MB SCP 801

MB ALFRESCO® PICTURE

# REPUBLIC OF ANGOLA

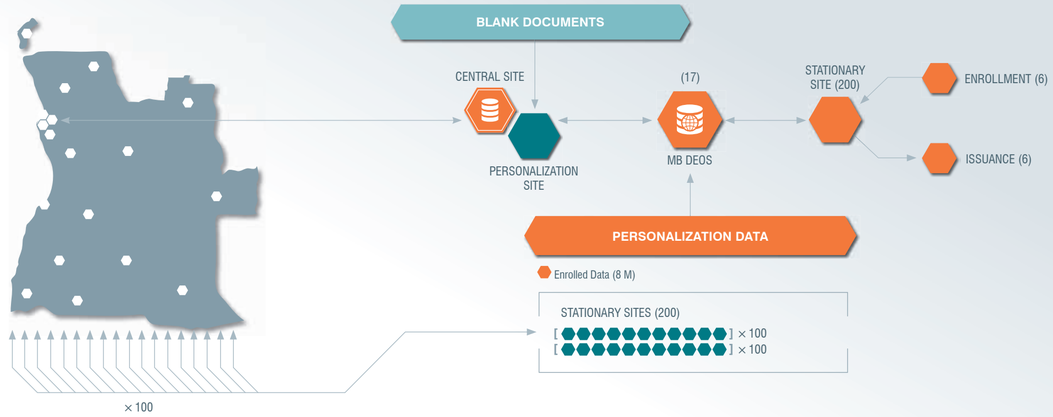
## CIVIL REGISTRY

The civil registry project of the Republic of Angola, awarded by the Ministry of Justice and starting in 2014, was designed to improve security standards in Angola and optimize the interoperability between ministries through a reliable database. Mühlbauer worked in close cooperation with its partner on site to provide the complete infrastructure for an accelerated and secure national registry of all citizens.

Within only six months, Mühlbauer provided the complete hardware and software infrastructure comprising about 200 decentralized enrollment sites which are equipped with a total of 525 easy-to-operate MB GET-ID systems. They enable the comprehensive capturing of the applicants' demographic and biometric data and the scanning of official documents.

17 decentralized MB DEOS-sites have been established to process the collected data and send it to designated notaries for verification. Thus, it is ensured that the registered individuals are legal citizens of the Republic of Angola. The verified data is stored in the central national register in Luanda. It manages all data to avoid duplicated identities and handles all relevant registration steps such as birth registration.

Once an applicant's data has been enrolled, a confirmation letter is issued. It is valid as soon as the data has been verified and serves as a breeder document for further ID documents. Due to extensive training, the local staff has been enabled to autonomously register 8 million people in a minimum of time.





Customized MB GET-ID Mobile


Centralized Server Structure

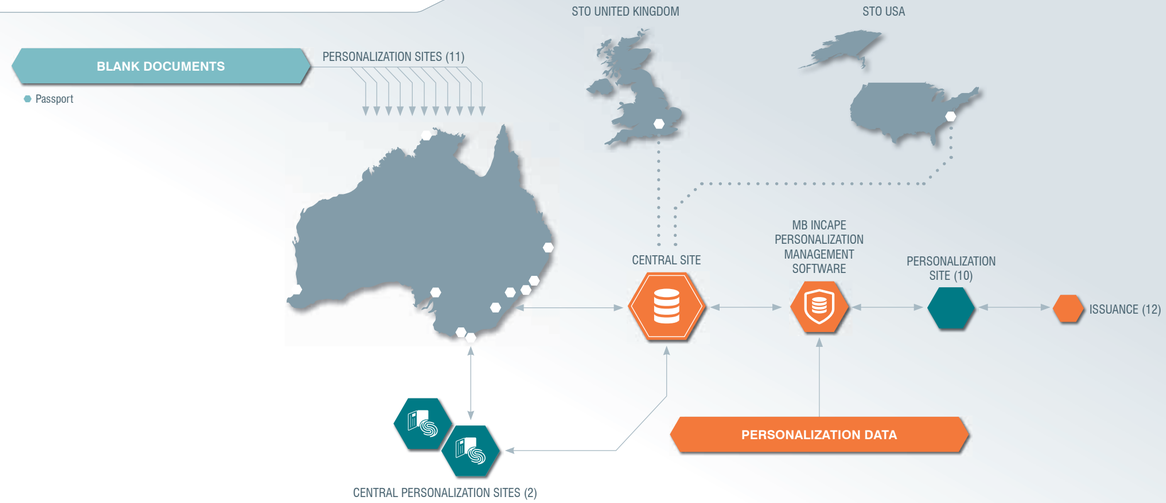
Documents Hardware Software

# COMMONWEALTH OF AUSTRALIA

## ePASSPORT PERSONALIZATION

The Australian ePassport project was awarded by the Department of Foreign Affairs and Trade (DFAT) in 2013: The project was supposed to both renew all personalization equipment and introduce a comprehensive solution (including quality print and lamination of data pages) for an average annual volume of 2.5 million ePassports. Thanks to a previous successful cooperation, Mühlbauer was designated to provide the complete personalization hardware and software, as well as the personalization management system. The 5-year project also included the seamless integration of the new system into the existing infrastructure, the supply of the complete line consumables for the project, the training of local staff, which was provided by experienced on-site staff, as well as the provision of full-time local maintenance and service support.

For the personalization of the ePassports, two centers with high-volume personalization equipment were set up in Melbourne. Additionally, documents are personalized in nine domestic and two foreign state offices in London and Washington D.C., which are all linked to the central data site and equipped with desktop personalization systems. In the course of the personalization process, MB INCAPE collects the datasets from the central secure document management system, transfers them to the personalization center and prepares them for further processing. Then the ePassports are personalized with the prepared datasets.
The finalized documents are issued to the applicants by means of secure, high-speed passport mailing systems. Applicants can directly collect the finished documents in the domestic and foreign state offices.





MB IDENTIFIER 60


ePassport Mailer

# BOSNIA & HERZEGOVINA

## DRIVER'S LICENSE, NATIONAL ID CARD & ePASSPORT

The Agency for Identification Documents, Registers and Data Exchange of Bosnia & Herzegovina (ID-DEEA) has selected Mühlbauer to deliver the hardware and software for the production of ID-1 card bodies and ePassports. The card and passport production processes are managed by the Mühlbauer production management system MB INCAPE and the material management system MB INCAPE WAREHOUSE, which are located at the Mühlbauer production facility in Banja Luka. They are responsible for planning, processing, controlling and handling all production orders and material for the card and passport production center.

The Bosnia & Herzegovina ID card has successfully been issued since March 1st, 2013. The image of the ID card holder is pre-personalized in line with the latest technology for color images on ID documents and stored in one of the inside layers of the polycarbonate, thus preventing any possible misuse. All personal data and machine-readable zones are laser-engraved in the second inner layer of the polycarbonate card. Personal and other data are stored within the chip module in a digital and highly secure manner. The third-generation ePassport with Supplemental Access Control (SAC) has successfully been issued since October 1st, 2014. The passport holder's image is pre-personalized in line with the latest technology for color images on ID documents and stored in one of the inside layers of the polycarbonate, preventing any possible misuse. All personal data, ghost image and machine-readable zones are laser-engraved in the second inner layer of a polycarbonate page. Personal and other data are stored within the chip module in a digital and highly secure manner, in line with the latest standards.



Driver's License – Front


Driver's License – Back


National ID Card – Front


National ID Card – Back


ePassport Booklet


ePassport Holderpage

Documents Hardware Software

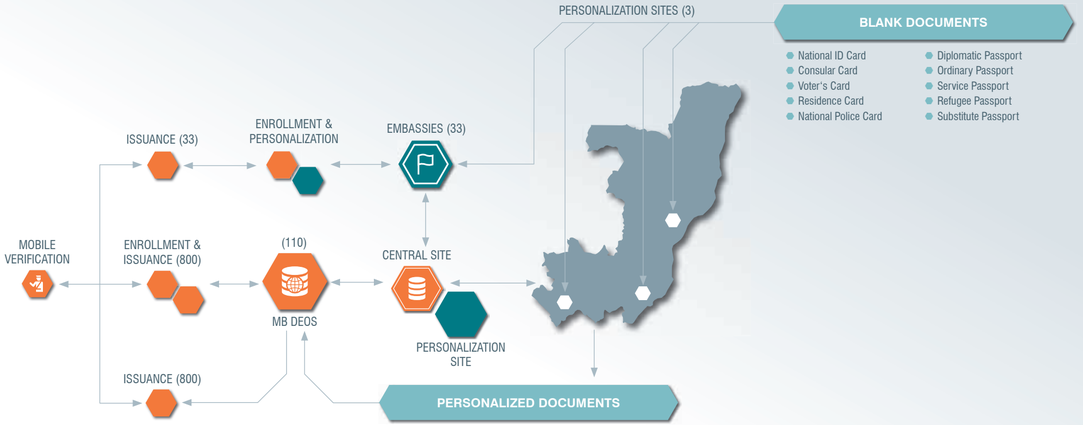
# REPUBLIC OF THE CONGO

## NATIONAL ID CARD & ePASSPORT

The Congolese identity project, awarded by the Ministry of Interior and starting in late 2011, comprised the development and implementation of the customized infrastructure for the issuance of high-secure ID documents. Serving as a model example for the setup of a complex system, this solution includes an extensive range of documents. Along with the existing database, the registry forms the basis of the complete national census of all citizens.

The project started with comprehensive consulting and the development of the system architecture involving the setup of 800 decentralized mobile MB GET-ID enrollment units. 105 decentralized MB DE-OS-sites collect and process the data. From there, they are transferred to and managed by the central database SDM. The high-secure blank documents, produced and delivered from Mühlbauer Germany, are personalized in three sites in the capital Brazzaville, in Oyo and Pointe-Noire. From there, the finished documents are forwarded to the decentralized sites for issuance. 33 embassies abroad have been equipped with units providing for enrollment, personalization and issuance of visas, substitute passports and consular cards.

Another part of this successful project is the police card solution, involving the complete hardware and software infrastructure for the registry and issuance in five decentralized offices, as well as the central database and the personalization of the blank documents in Brazzaville.





National ID Card


Consular Card


Residence Card


Voter's Card


Police Card


Mobile Verification


ePassport Booklet

Documents Hardware Software

# REPUBLIC OF THE CONGO

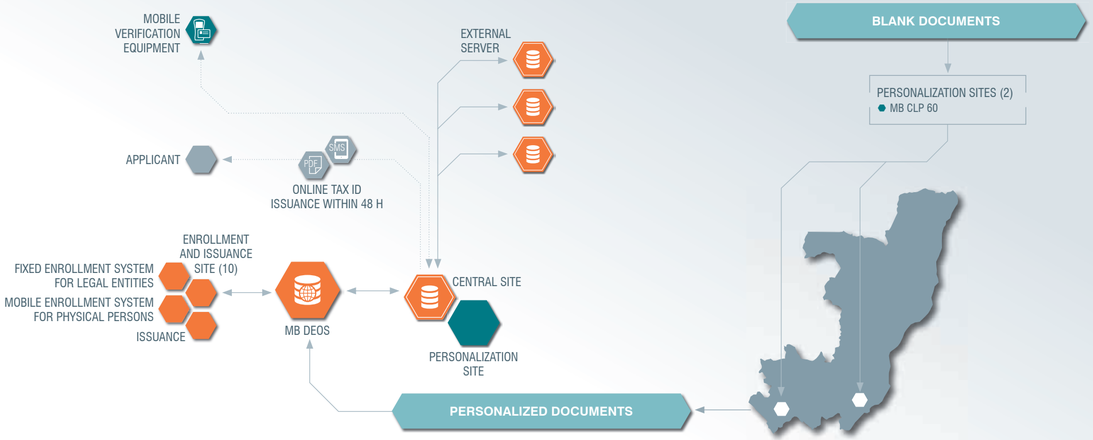
## TAX ID CARD

In early 2018, after the successful collaboration in the issuance of the Congolese National ID Card and e-Passport, the Republic of the Congo awarded Mühlbauer another flagship project: In order to reliably support the registration, identification and life cycle of all the country's tax payers, Mühlbauer – in close cooperation with the Congolese Ministry of Finance and Budget – developed a solution for the issuance of high-secure biometric Tax ID Cards.

In ten enrollment stations across the country, private individuals as well as legal entities can get enrolled for the tax card via dedicated MB GET ID enrollment systems. Enrolled applications are then forwarded to the main data center, where a unique tax payer's ID is generated. The applicant's demographical data and biometrics (fingerprint and iris) are used to secure the identification process and thus guarantee the tax ID's uniqueness. Multiple registration attempts and other inconsistencies can be detected by the sophisticated combination of the two software components MB SDM and MB ABIS. Within 48 hours – as required by international standards – the applicant receives an electronic document with a unique tax ID via email (in PDF format) or SMS. In a second step, a chip-based Tax ID Card is personalized in two personalization sites (in Brazzaville and Pointe-Noire) by one of four personalization machines with state-of-the-art laser engraving and chip encoding technologies, and an overall throughput of 200.000 cards per year.

Once the biometric Tax ID Cards have been issued, they are handed over to the applicant and can be used on verification devices for the visualization of the data digitally stored on the chip, as well as for the verification of the tax payer's identity.

Via a third-party interface, the biometric Tax ID Card issuance system also offers the possibility to securely exchange data with external entities such as tax authorities, customs or banks.





Tax ID Card – Front

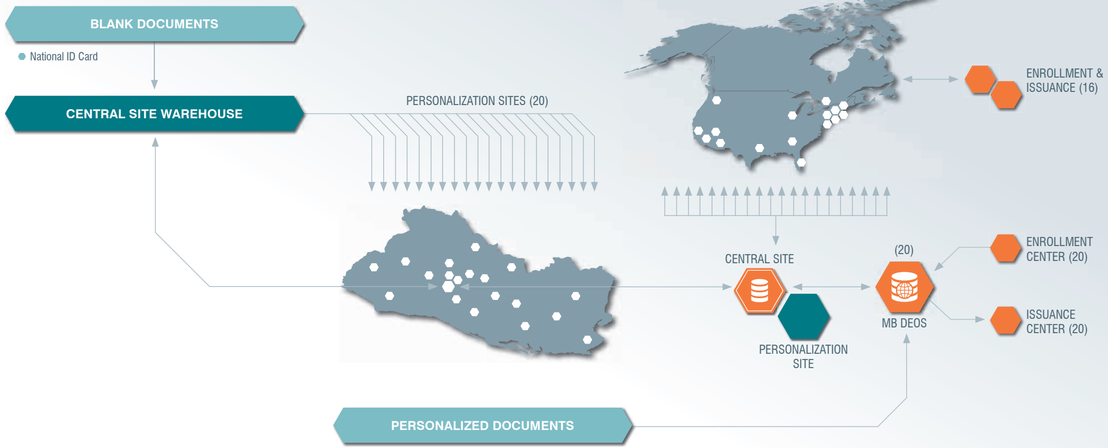
Tax ID Card – Back

Documents Hardware Software

# REPUBLIC OF EL SALVADOR

## NATIONAL ID CARD

In 2011, Mühlbauer was awarded by the Government of El Salvador to implement and operate a comprehensive National ID Card Solution for the people of El Salvador. The solution comprised twenty enrollment-, personalization- and issuance offices in El Salvador. In addition, Mühlbauer enabled 16 El Salvadorian consulates in the USA and Canada to receive applications and issue National ID Cards to El Salvadorian citizens.
The solution comprised the actual ID card, approval and issuance clients, national database, biometric system, data and document management system, secure communication with all sites (national and international) via MB DEOS, as well as personalization machines and software. The project is based on a Public Private Partnership agreement and executed as a Built-Operate-Transfer (BOT) project.
In June 2015, the BOT-project was renewed for five additional years. Within the scope of the contract extension, the second generation of ID cards with enhanced security features will be issued. The Government intends to issue 3 million ID cards within the first 15 months, and a total of seven million cards from 2015 to 2020. Today, Mühlbauer employs over 250 people in El Salvador. Mühlbauer El Salvador, with its qualified staff, is the backbone for all Mühlbauer operations in Central America.





National ID Card – Front


National ID Card – Back

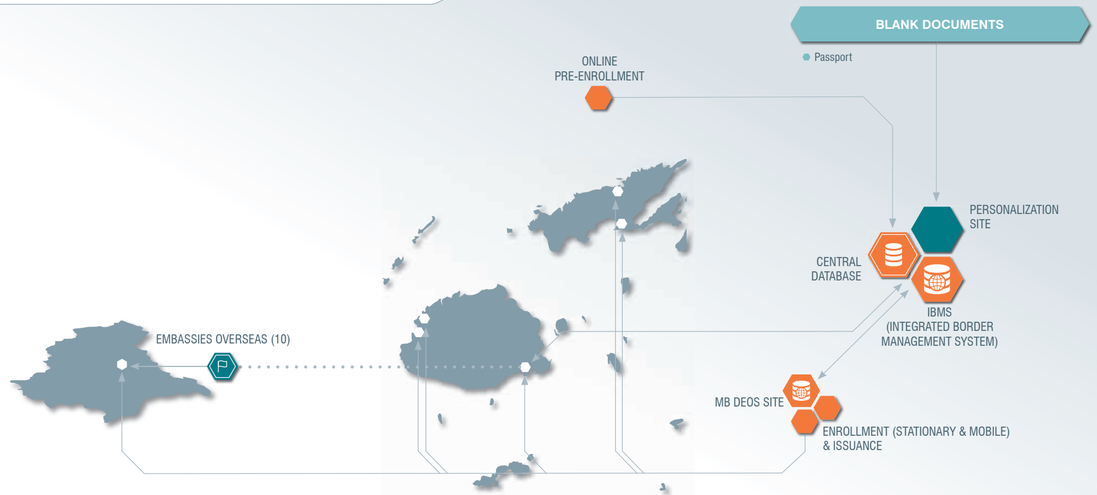
# REPUBLIC OF FIJI

## ePASSPORT

As a part of its major project to modernize the country's security infrastructure, the Republic of Fiji decided to evolve its next generation of passports to ePassports. That is why, in 2019, the Fijian Government selected Mühlbauer to trustfully handle and implement a customized, high-secure solution for the personalization and issuance of state-of-the-art ePassports. The project comprises the specification, customization, delivery and installation of the necessary IT and security infrastructure (hard- and software) for the personalization (printing) and issuance of four types of ePassports (Ordinary ePassport, Official ePassport, Emergency ePassport & Diplomatic ePassport). Furthermore, Mühlbauer provided services such as consulting, comprehensive know-how transfer by conducting trainings for the local staff of the Fijian Department of Immigration (DOI), as well as production support, service and maintenance.

Furthermore, Mühlbauer integrated the existing infrastructure of the Republic of Fiji's Border Management System (IBMS) into the new ePassport system. Citizens of the Republic of Fiji can pre-register for the enrollment online before they perform the live enrollment process in one of the countrywide 5 enrollment offices which are each endowed with stationary high-tech enrollment equipment. In addition, the DOI also can resort to mobile enrollment kits that enable a transportable means of registration. The applicant's data are then collected in one of the MB DEOS sites and processed to the central database in the country's capital Suva.
The blank documents are then personalized at the central personalization site in Suva and sent to the respective applicant by letter. In oversea embassies, Fijian citizens also have the possibility to enroll for an ePassport.

ePassport





ePassport Booklet | Diplomatic ePassport Booklet | Emergency ePassport Booklet | Official ePassport Booklet

Documents · Hardware · Software

# GEORGIA

## NATIONAL ID CARD & eGATES

The national identity project of Georgia was awarded by the Public Service Development Agency of the Ministry of Justice and started in 2010. The introduction of the most advanced eID card worldwide set a milestone in the field of ID document solutions. The polycarbonate dual interface card does not only serve as a national ID document, but it also holds an embedded chip for different services like digital signature, eBanking, eHealth, access control, payment function and public transport applications.

This project is an outstanding example for the seamless integration of established standards and latest innovations into an existing infrastructure. The system architecture was enhanced by a centralized personalization site in the capital city and two decentralized sites; all of these centers were equipped with the latest personalization technologies and mailing systems for the issuance of the finished documents. Five MB GET-ID MOBILE units were added to the existing network of decentralized enrollment sites. Mühlbauer produced the high-secure blank documents in Germany and quarterly delivered them to a central warehouse in Georgia. They were then distributed to the three personalization sites.

In 2011, the follow-up project was awarded by the Ministry of Internal Affairs: the implementation of Automated Border Control units at the higher frequented Georgian airports of Tbilisi, Batumi and Kutaisi, and at four pedestrian border crossing points. The fast and reliable verification of Georgian citizens includes the matching of a person's individual data with a variety of databases like the citizen register and several alert lists.



National ID Card – Front

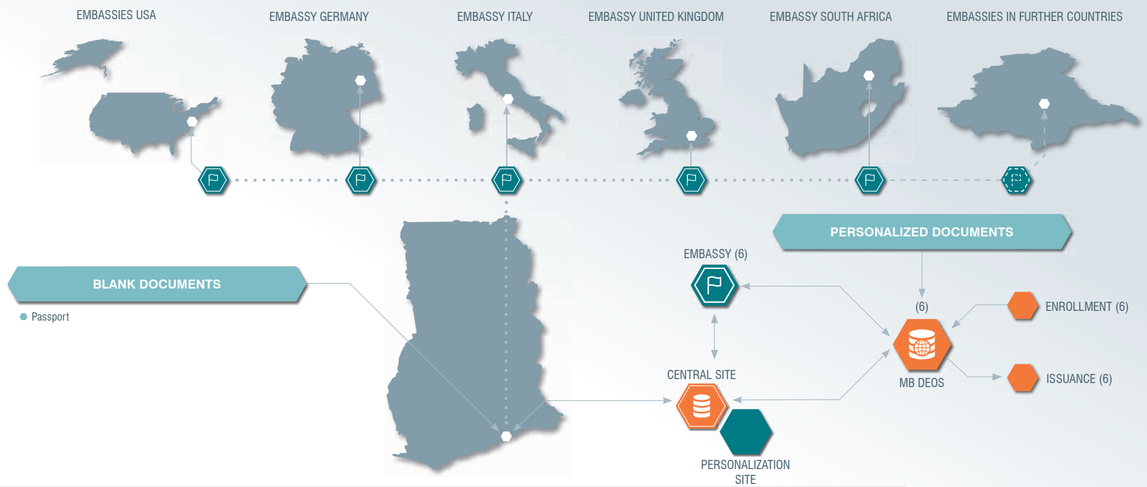

National ID Card – Back


Automated Border Control (ABC)

# REPUBLIC OF GHANA

## ePASSPORT PERSONALIZATION & INSTANT ISSUANCE

The ePassport issuance solution project for the Republic of Ghana started in 2015. It has set a new worldwide standard as it is the first solution which includes decentralized personalization on site and instant issuance of the finished ID documents outside the home country. Within only two months, six sites have been set up in embassies in Europe, North America and South Africa. The Ghanaian embassies act as decentralized centers where citizens can apply for new documents and have their complete demographic and biometric data enrolled. All centers are connected to the governmental national database in the capital Accra. There, the applicants' captured data are checked to ensure that they are legal citizens. The data is securely transferred to the central database by means of the latest encryption technologies. All newly captured data and all acquisition processes are registered in the national database granting full transparency to the Ghanaian institutions worldwide. Within a short space of time, the blank ID documents can be personalized with the applicant's prepared dataset by means of high-end desktop personalization equipment. Before the finished document is handed over to the applicants, they have to be verified once again. For this purpose, MB GET-ID MOBILE collects the citizen's live data and matches them with the stored data. Within the smallest amount of time, Ghanaian citizens are provided with their new ID documents.




MB GET-ID MOBILE

MB IDENTIFIER 6

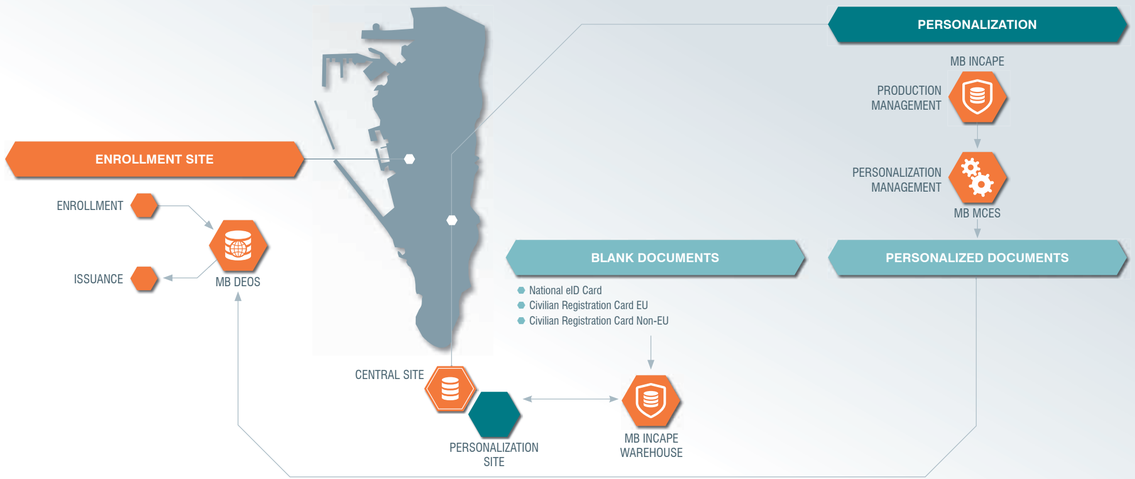
# GIBRALTAR

## NATIONAL ID CARD

The ID card project for HM Government of Gibraltar features Mühlbauer's most advanced ID card with a variety of integrated services. The idea behind the project was to provide a high-secure biometric ID (and travel) document which significantly simplifies government services for citizens. The eID card ensures the secure log on to a newly developed web portal to access all electronic services. Moreover, the eSignature functionality makes it possible to digitally sign electronic documents. The eID card also allows free access to education centers, libraries, parking and public transport. The new ID card itself is a highly durable PC (polycarbonate) card with outstanding security features. It is issued to the applicants only after their existing documents have expired.

Mühlbauer provided the complete hardware and software infrastructure and seamlessly integrated it into the existing environment. Local staff received extensive training in advance to ensure the smooth operation during the ramp-up, which was also accompanied and supported by Mühlbauer.

The enrollment centers are equipped with 10 MB GET-ID systems which capture the demographic and biometric (facial image) data. After the enrollment, the data is processed and transferred to the personalization management system which initializes the personalization of the blank document by laser engraving and chip encoding. The customized personalization systems, which have already been used for the personalization of Gibraltar's driver's licenses, were upgraded with chip coding and vision inspection modules to enhance their functionality. After the identity is authenticated at the enrollment and issuance center, the citizen receives the new ID card within a few days.





Civilian Registration Card EU – Front


Civilian Registration Card EU – Back


Civilian Registration Card Non-EU – Front


Civilian Registration Card Non-EU – Back


eID Card – Front


eID Card – Back

# REPUBLIC OF GUATEMALA

## ID-Card & Resident Card

In 2016, the National Registry of Persons (RENAP) of the Republic of Guatemala awarded Mühlbauer for the delivery of an overall of 6 million pre-personalized identification documents (DPI) used for the Guatemalan ID and Resident Card.
As main solution partner, Mühlbauer ensures the provision of polycarbonate Smart Cards in ID-1 format. Accor¬ding to the international standard ISO 7810: 2003 Identification Cards, all cards are equipped with a contact-based chip with an EEPROM of 80 KB. The multi-application card is endowed with a Match-on-Card applet, which enables convenient and secure fingerprint authentication, as well as with PKI and an ICAO ID and travel applet.
Mühlbauer pre-personalizes all high-secure cards and the chips they contain at the Technology Center at the company headquarters in Roding (Germany) and delivers them in batches to Guatemala. At the RENAP headquarters in Guatemala-City, Mühlbauer also provides all necessary support for a seamless card personalization process with the desktop card personalization system MB SCP 60 and the mid-volume personalization system MB SCP 1500.



Resident Card – Front


Resident Card – Back


ID Card – Front


ID Card – Back

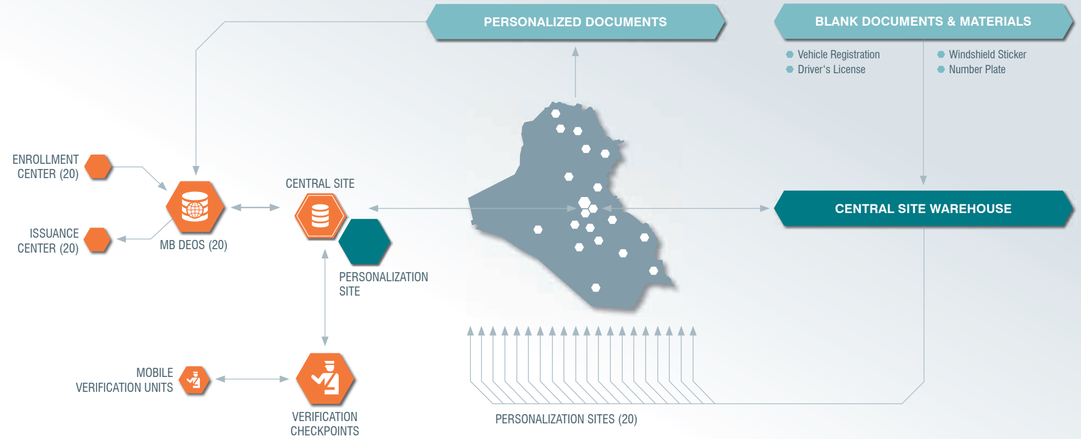
Documents Hardware Software

# REPUBLIC OF IRAQ

## DRIVER'S LICENSE & VEHICLE REGISTRATION

The Iraqi driver's license and vehicle registration project started in 2010 and represents the exemplary solution for the setup of a complete infrastructure. The solution comprised a central data site, a disaster recovery center in Baghdad and 20 decentralized sites. They are all equipped with live data enrollment hardware and software, offline enrollment units for the registration of the demographical and biometric data (fingerprint and iris), high-end laser for the document personalization and number plate pressing, as well as, for the issuance of the finished documents. The data is registered live, then processed and – depending on the distance to the capital city – transferred to the central data site either by VSAT or fiber optic. 2 million blank documents with high-end security features are delivered from the production site at Mühlbauer Germany to a central warehouse in Baghdad. From there, the documents are distributed to the decentralized sites issuing the complete set of documents, e.g. the vehicle registration card, the windshield sticker and the driver's license, along with the license plates. The high-secure software infrastructure comprises the complete data management, personalization management and data security.

The system architecture provides access to the central data site by authorized governmental institutions via web portals. Thus, the checking of the individual's complete registered and stored data is possible. The authorities received handheld devices for car inspections (taking place within assigned checkpoints) which are connected to the central database so that the data can easily be matched.





Driver's License – Front


Driver's License – Back


Vehicle Registration – Front


Vehicle Registration – Back

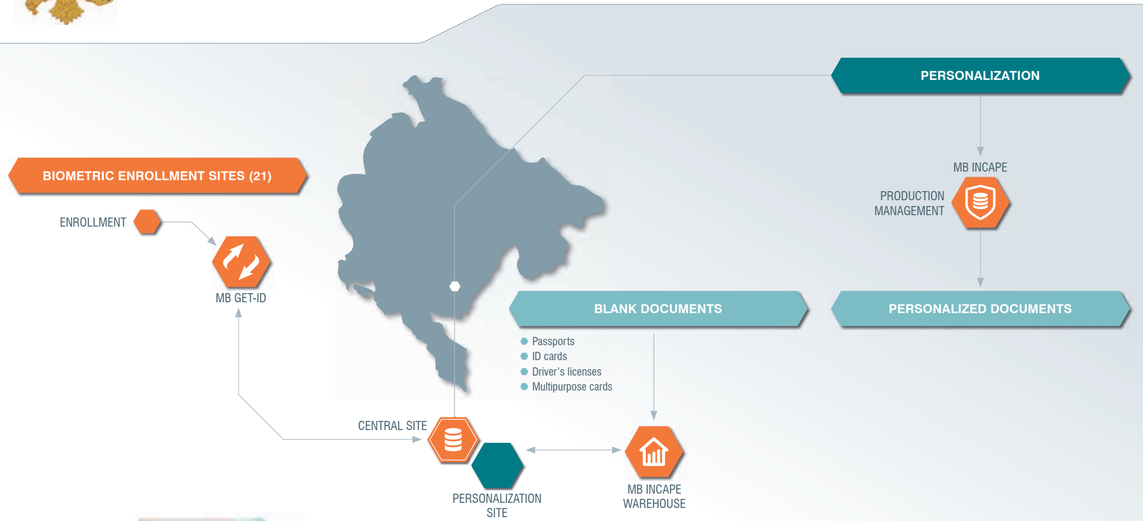

Mobile Verification

Documents Hardware Software

# MONTENEGRO

## NATIONAL eID CARD, ePASSPORT, DRIVER'S LICENSE, MULTI-PURPOSE CARDS

The Montenegrin identity project, awarded by the Ministry of Interior in 2019, is a best-practice example for a comprehensive document solution. It encompasses the delivery of a high-tech system for the production and personalization of the next generation of Montenegro ePassports and ID1-format ID cards, driver's licenses and resident permits. In addition to the development of individual security design concepts for all the ID documents provided, Mühlbauer ensured the seamless supply of blank documents. The project's scope also included the delivery of a countrywide network of 21 high-tech biometric enrollment stations and document issuing sites, as well as systems for data management and state-of-the art document personalization by means of MB ALFRESCO® Picture. The project further comprises a central system for the issuance of all documents and the set-up of software components, e.g. the enrollment and issuing software MB GET-ID, the personalization platform MB INCAPE and a Public Key Infrastructure (PKI). All software components are centralized in the Montenegrin capital Podgorica.
As main solution partner to the government of Montenegro, Mühlbauer provided all necessary support to ensure a seamless implementation of the project. The system went live in December 2019 and ever since then the authorities of Montenegro can resort to a cutting-edge system for the personalization and issuance of high-secure ID documents.





National ID Card


Multi-Purpose Card


Driver's License

ePassport Booklet

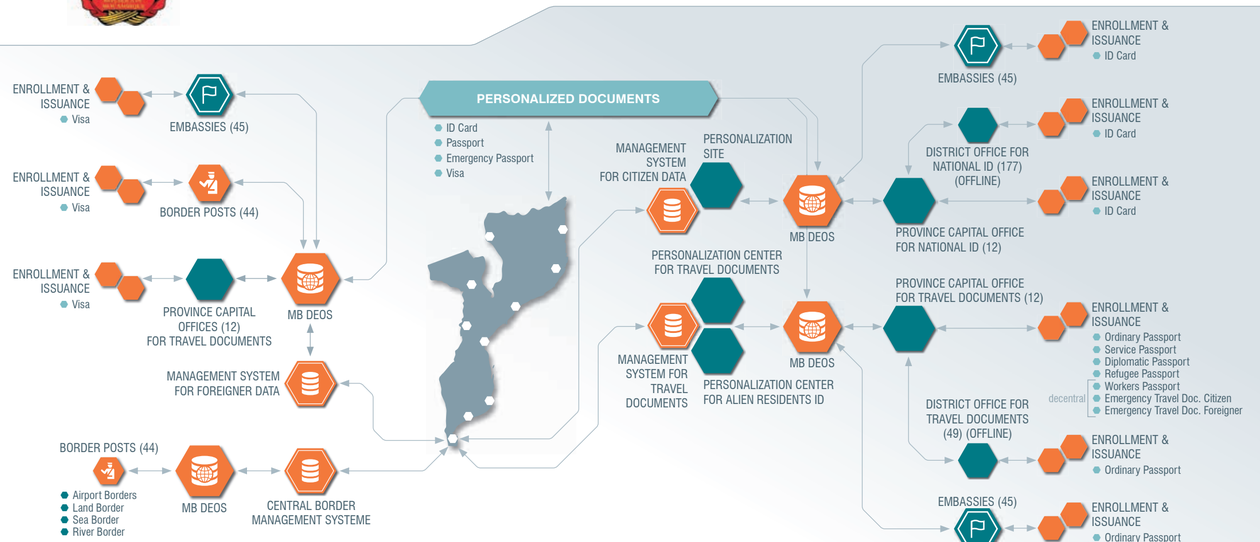

ePassport

Documents Hardware Software

# REPUBLIC OF MOZAMBIQUE

## DOCUMENT ISSUING SOLUTION AND BORDER MANAGEMENT SYSTEMS, ID CARDS, TRAVEL DOCUMENTS & VISA

In 2018, the authorities of Mozambique awarded a concession with a contract period of eight years on the basis of a public-private partnership (PPP) model to Mühlbauer. The project's scope was it to deliver, distribute, install and ramp-up a state-of-the-art system for the issuance of multiple types of identification documents for citizens and visitors. The project also included a border crossing solution and training of staff. It was to be delivered within a period of just six months after the contract signature. The management systems were distributed nationwide to 12 provinces and 177 districts, to all 13 airports, to 31 land, river and sea borders and to 45 embassies and consulates worldwide. The system can be fully operated online and offline (depending on network availability) and has the highest IT security standards regarding data security, data transfer and data loss. The system consists of four independently operable data bases for four independent authorities (citizen data, foreigner data, travel documents and border management) which are all interlinked and interoperable for national security and information purposes. On a nationwide basis, the government issues biometric national identification cards and electronic travel documents, as well as biometric emergency travel documents for all citizens of Mozambique. In embassies and consulates, the issuance of travel documents, identification cards and emergency documents for nationals of Mozambique is supported as well. For visitors, biometric visa documents can be issued at all airports and border posts, as well as in consulates and embassies. Furthermore, resident alien cards and biometric emergency travel documents for foreigners as well as United Nation travel documents are produced.




National ID Card | Resident Card | Visa Sticker | Emergency Certificate | Emergency Certificate Foreigners | Workers Passport

Ordinary Passport Holderpage | Diplomatic Passport Holderpage | Refugee Passport Holderpage | Service Passport Holderpage

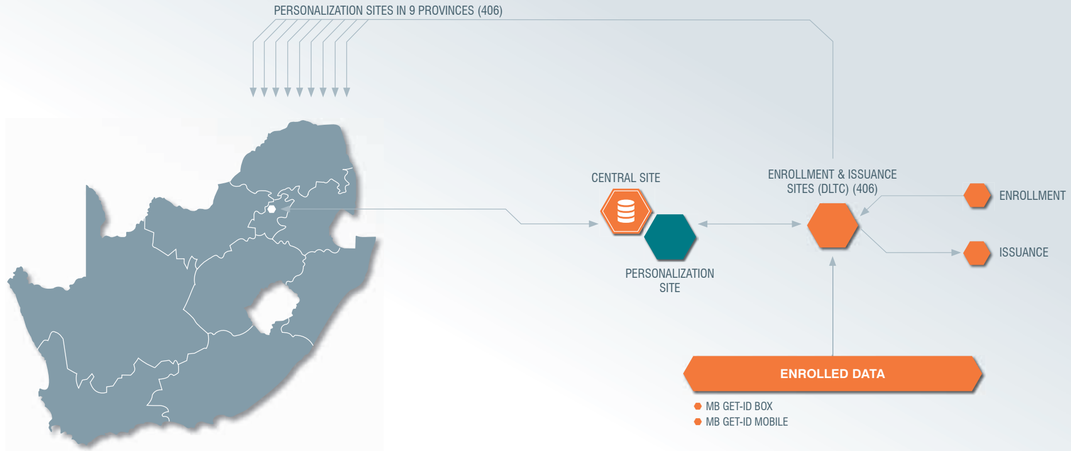
# REPUBLIC OF SOUTH AFRICA

## ENROLLMENT FOR DRIVER'S LICENSE

In January 2016, the contract with the South African Driving Licence Card Account (DLCA) of the Department of Transport was finalized: It set off a comprehensive project for the provision of the new Live Enrollment Units (LEU) named "MB GET-ID BOX" for the driver's license applications in South Africa. They replaced the outdated systems which had been used throughout the whole country for over a decade. Mühlbauer was working in close cooperation with a local company to deliver 1000 LEUs which were distributed among 406 Driving Licence Testing Centers (DLTC) across all nine South African provinces.

The project's central effort was the development of customized units within a short amount of time. These units all have peripheral devices, such as scanners, cameras and eye testing systems, permanently and securely installed in a specially designed casing. The devices capture the applicants' demographic and biometric (face, fingerprint, signature) data. Afterwards, an acuity and peripheral vision test is conducted. The customized units are designed to accommodate all existing back-end system interfaces to ensure seamless replacement. Moreover, a special and intuitive user management was developed.

In order to monitor the LEU's activity across the country, a special control system was set up: It tracks the coordinates, makes them appear on a dedicated location map and checks the availably of the units, as well as the entire infrastructure in terms of failures in applications, services, servers and devices. An additional part of the project was the formulation of a successful change management program. It included the conduction of a comprehensive training to enable the local partners to operate the new systems and to train further operators in turn.





MB GET-ID BOX


Fingerscan

Documents Hardware Software

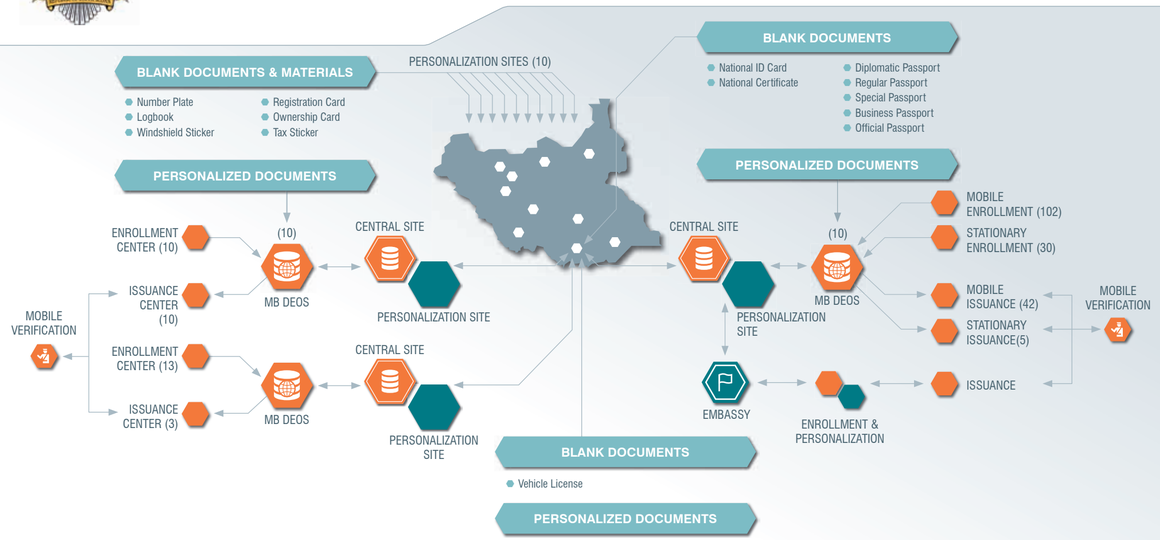
# REPUBLIC OF SOUTH SUDAN

## NATIONAL ID CARD, ePASSPORT & VEHICLE REGISTRATION

The South Sudan BOT-project (Build-Operate-Transfer), awarded by the Ministry of Interior in 2011, is the best-practice example for a comprehensive document solution. It encompasses the national ID card and ePassports, the driver's license and the vehicle registration system. The system architecture (including a disaster recovery system for producing and accessing ID documents at embassies abroad) and the design of the polycarbonate documents, which were determined by technical and geographical requirements, were established in close collaboration with the authorities at site. With regard to a complete know-how transfer, the local staff received comprehensive training during the course of the project to ensure an autonomous operation of the system.

The infrastructure comprises the central site, located in the capital Juba, which process and manage data of each sub-project, as well as ten decentralized service sites – one of them located in every capital city of the ten South Sudan States – for the enrollment of ID documents. The decentralized vehicle registration sites, connected to the central site by VSAT, are equipped with high-security printers and number-plate presses for the registration, renewal and production of the documents. ID cards and ePassports, however, are personalized in the capital city.

Driver's licenses are issued in a registration center in Juba only, offering pre-registration and issuance of new and renewed documents. For the verification of individuals, documents and vehicles, the traffic police have been equipped with ten mobile handheld devices.




National ID Card | National Certificate | Vehicle Registration | Driver's License

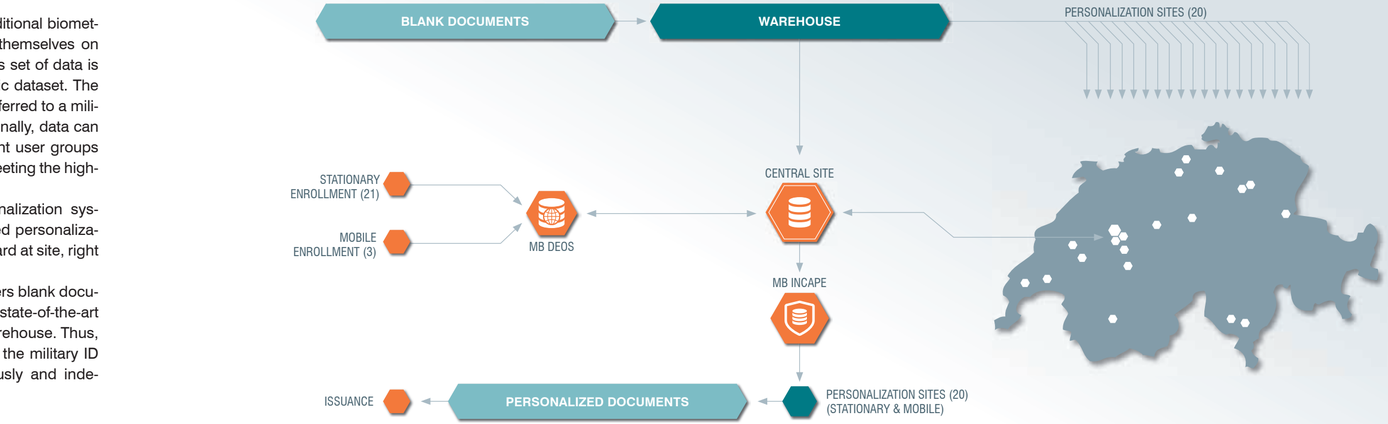
Passport Booklet | Mobile Verification

Documents ● Hardware ● Software

# SWISS CONFEDERATION

## MILITARY ID CARD

With the Swiss Military ID Card, Mühlbauer delivered a card with a variety of integrated services (for example time recording and various access functions) apart from the identification of the card holder.
The scope of the project was the delivery of the complete solution for the enrollment of demographic and biometric data and the pre-personalization and personalization of the high-secure military ID card. Moreover, the complete software structure was set up, including per-sonalization management, data and document management, data matching with the national registry, as well as user management components.
A special solution approach is the biometric enrollment by means of MB Self-Enrollment KIOSKS: After receiving the conscription order, all recuits have to undergo medical examination during which their personal data are requested from the national registry and processed by operators via webportal. The military recruits then perform the additional biometric enrollment (face and signature) themselves on the MB Self-Enrollment KIOSKS. This set of data is then combined with the demographic dataset. The enrolled data is processed and transferred to a military server at the central site. Additionally, data can be enrolled via webportal for different user groups (for example external contractors) meeting the high-security requirements.
Every site is equipped with personalization systems, thus enabling the decentralized personalization and issuance of the military ID card at site, right after examination.
Via webportal, the administrator orders blank documents, which are equipped with state-of-the-art security features from the central warehouse. Thus, the personalization and issuance of the military ID card can be performed autonomously and independently from the central site.




MB Self-Enrollment KIOSK

# PARTNERS

# EXEMPLARY QUOTES

***"We really appreciate Mühlbauer's work which met all of our high expectations in terms of quality and security of the complete national ID card project."***
Colonel Henri Jacques Kienaka, Le Directeur de l'Identification Civile, Ministère de la Sécurité et de l'Ordre Public, Republic of the Congo; Project: ID Card Issuance Solution

***"Mühlbauer's technology is fundamental for our citizens to have a reliable identity document."***
Margarita Velado, President of Natural Persons National Registry (RNPN), Republic of El Salvador;
Project: ID Card Issuance Solution

***"Mühlbauer turned out as very competent and flexible and we feel confident with choosing MB as a technology provider."***
Brigader Majed Shanon, The Manager of Traffic Project, General Directorate of Traffic Police, Ministry of Interior, Republic of Iraq, Project: Driver's License and Vehicle Registration Card Personalization

***"Mühlbauer's solid expertise and client-oriented approach were instrumental in the realization of this very successful project."***
Giorgi Gabrielashvili, Head of the Civil Registry Agency of Ministry of Justice, Georgia, Project: eID Card Issuance Solution

***"We are glad to have MB as a reliabe partner; the technology and services provided by MB have proven excellence."***
D. Flavio Ramon Brocca, IT Head of the Civil Registry, Argentine Republic; Project: eGate

***"We feel very confident with the technology and services provided by Mühlbauer and are convinced that we made the right selection."***
Brig. Gen. Augustino Maduot Parek, Director General of Nationality, Passport and Immigration, Ministry of Interior, Republic of South Sudan; Project: Identity Document Issuance

***"We express our deep respect towards Mühlbauer for the reliable partnership."***
Giorgi Tepnadze, Manager of the Head Office, Operative Technical Department, Ministry of Internal Affairs, Georgia, Project: eGate

***"Mühlbauer supported us in all matters in a flexible and client-oriented manner."***
Carlos Lago Iglesias, Director de Imprenta, Real Casa de la Moneda, Spain, Project: eID Card Personalization

***"Mühlbauer has proved to be a reliable contractor and has given its full and perfect support."***
Viktor Redcenco, Director of the Production Department, REGISTRU – State Information Resources Center CSIR, Republic of Moldova; Project: eGate

***"We highly appreciate Mühlbauer's support in this project. We feel confident that our decision to select Mühlbauer was the right one."***
Jamoliddin Ubaidulloev, Head of Consular Department of the Ministry of Foreign Affairs of Republic of Tajikistan; Project: ePassport

***"Mühlbauer was in the position to manage this project in a highly professional way."***
František Maleč, Technical Director, Státní Tiskárna Cenin, Czech Republic; Project: ePassport Personalization

***"We appreciate Mühlbauer as a reliable, solution-oriented, flexible and strong partner in our ePassport project during all stages of planning and implementation."***
Slobodan Nedeljkovic, Assistant Minister, Head of Sektor, Ministry of Internal Affairs, Serbia; Project: ePassport

***"We appreciate Mühlbauer as a reliable, solution-oriented, flexible and strong partner."***
Issac Ieng Kit Lai, Director Identification Services Bureau, The Macau Special Administrative Region Government;
Project: ePassport Issuance Solution

***"We feel to be in good hands with Mühlbauer."***
Jacqueline Kwan, Assistant Director of Immigration, The Government of the Hong Kong Special Administrative Region, Project: ePassport Personalization

***"We are very satisfied with the choice of our manufacturer. The cooperation with Mühlbauer is trusting and constructive."***
Walter Valeri, Director Passport Production Center, Department of Foreign Affairs and Trade in Australia, Project: Hardware and Related Services for the Personalization of the Australian Passport

***"Mühlbauer has provided excellent service and support for the recently completed biometric enrollment of approx. 5 million citizens in the very short time frame of 6 weeks."***
A.M. Kirunda Kivejinja, 3rd Deputy Prime Minister / Minister of Internal Affairs, Republic of Uganda,
Project: ID Card Issuance Solution

# RELIABLE PROJECT PARTNER

With our vision and our innovative solutions we have earned the confidence of governments and public authorities worldwide and we convince them every day anew. We are committed to our customer's complete satisfaction and see ourselves as their partners. Our most important values – trust and reliability – serve as the central guidelines for all our actions.

We convince by high speed, best quality and strict customer orientation before, during and after every single project. We guarantee comprehensive project planning, continuous risk management, effective monitoring and support until your individual solution has been seamlessly integrated into your infrastructure. These are the keys to success of your project. Throughout all process steps, we work in close partnership with all stakeholders to ensure a smooth course.

Your trust is our greatest motivation to turn every challenge into a success story.

Mühlbauer
High Tech International

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