



DX – Vehicle Licensing & Driver Licensing Services Platform





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1. Introduction

1.1. Dubai

Dubai’s revolution was driven by a bold vision to move beyond oil, creating a resilient and diversified economy that ensures sustainable prosperity for future generations. Through this vision, Dubai transformed limited resources into limitless opportunities, redefining the region’s destiny with ambition, sustainability, and progress.

Strategic Objectives

	Economic Diversification: Build a knowledge-based economy beyond oil, focused on trade, tourism, finance, and innovation.
	Global Positioning: Establish Dubai as an international hub and a bridge between East and West.
	World-Class Infrastructure: Develop smart city initiatives, advanced transport, and sustainable urban design.
	Talent & Investment Magnet: Attract international expertise, entrepreneurs, and global investment.
	Innovation & Digital Disruption: Drive growth through AI, digital transformation, and emerging industries.
	Sustainability & Resilience: Secure long-term prosperity through green growth and responsible resource use.
	Cultural & Social Leadership: Promote Dubai as a centre of culture, tolerance, and opportunity.
	360 Services: To create a proactive, automated, integrated, and seamless service ecosystem for all government services.

1.2. RTA

Inspired by the vision of His Highness Sheikh Mohammed bin Rashid, and in pursuit of Dubai’s bold strategic objectives, the Roads and Transport Authority was created in 2005 to provide an advanced transport network for the people and to prioritise the initiatives that enhance the public transport facilities and improve roads across the emirate to make travel safer and smoother.

RTA Vision: The world leader in seamless & sustainable mobility.

RTA Mission: Providing seamless and safe travel with innovative, sustainable mobility.

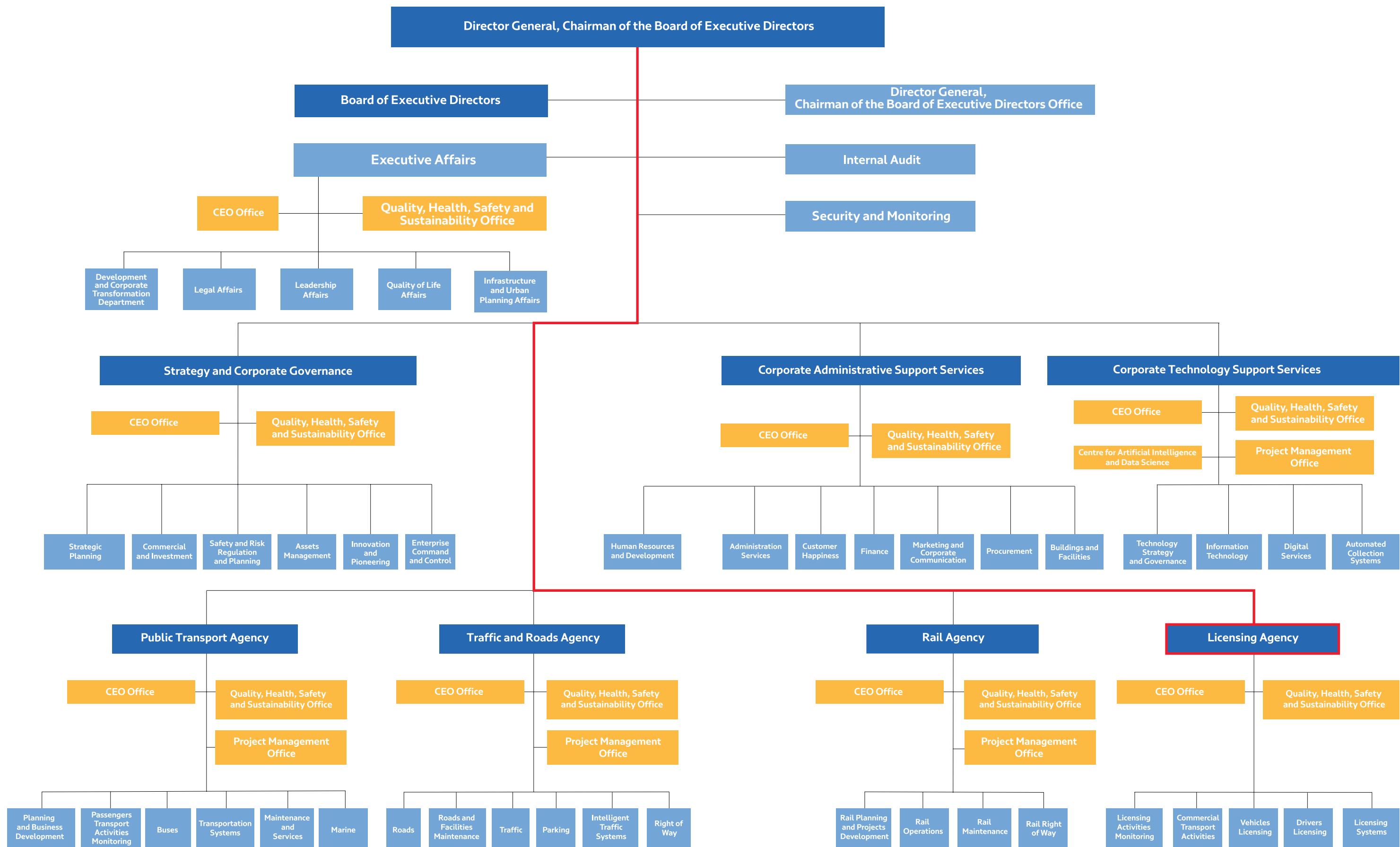
Strategic Goals and Objectives:

	1. Seamless and Innovative Mobility		2. Sustainability
	3. Health, Safety, and Security		4. Customer Happiness
		5. Future-Proof Organisation	

RTA contributed to Smart Urban Mobility through intelligent projects such as Smart Street Lights, Intelligent Pedestrian Crossing, Smart Vehicle & Driving Licensing Services, Parking Guidance System, Smart Parking App, Smart NOL (which is the automated & integrated fare collection system), Enterprise Command and Control Centre, S'hail App, Regulatory and Monitoring System (both part of Dubai Integrated Mobility Platform), Smart Bus Shelters, Bus on-demand, Real-Time Passenger Information System, and field trials on Self-Driving Vehicles and Autonomous Aerial Vehicles.

RTA aims to provide highly integrated, efficient, seamless, and connected mobility to citizens and visitors across different modes of transport such as metro, tram, bus, water taxi, taxi, cycling, and walking. RTA is working closely with Dubai Future Accelerators to bring innovative technologies and disruptive mobility solutions such as Hyperloop, Self-Driving Vehicles, and Autonomous Aerial Vehicles to add to existing Dubai modes of mobility.

1.3. RTA's Organisational Structure



1.4. Licensing Agency

The RTA's Licensing Agency was established by decree in 2008 in response to the increasing demand for licensing services, including the management and provision of driver and vehicle licensing services within the Emirate of Dubai. Its services are delivered through a combination of Agency-operated customer service centres, approved agent operators, and e-service channels.

The Licensing Agency's Drivers Licensing Department aims to train, test, and license skilled and safe new drivers and thus contributes to the RTA's strategic goal of enhancing safety and environmental sustainability and its related objective of enhancing transport and traffic safety to reduce accidents and fatalities, reduce road crashes, and road-related deaths and injuries in the Emirate and to innovate and enhance the customers' journeys in the licensing services.



1.5. Background

The Vehicle Licensing Department (VLD) plays a vital role in the Dubai transportation system, ensuring that all vehicles meet the necessary regulations and standards. The VLD is a main department and one of the five departments in the Licensing Agency that provides a wide range of services designed to facilitate safe and efficient transportation.

The Vehicle Licensing Department has the following responsibilities and activities:

Preparing the Policies & Standards Development:	Establishes policies, legislation, and technical standards to ensure the safety of vehicles.
Vehicle Registration:	Manages all aspects of vehicle registration and related services, which are: <ul style="list-style-type: none">• Register a Vehicle• Vehicle Ownership• Change Vehicle Ownership• Issue Vehicle Possessions• Change Vehicle Information• Export Vehicle to a Country• Transfer Vehicle to other Emirates• Vehicle Certificates• Plate Management Services• Vehicle Inspection
Plate Numbers:	Provides many services to own a new plate number and manage plate ownership.
Service Delivery:	Provides a range of licensing and vehicle registration services through customer service centres, approved agents, and online channels.
Monitoring & Enforcement:	Oversees and enforces compliance with licensing rules and regulations by service providers, ensuring the safety and responsible use of heavy vehicles.
Digital Services:	Offers digital transactions for various permits and vehicle-related matters, including paying fines and accessing vehicle information.

The Drivers Licensing Department (DLD) falls under the Licensing Agency (LA) and is headed by the DLD Director. The department consists of three main sections: Drivers Testing, Driving License Issuance, and Driving Permits. Its mandate is to regulate and manage all drivers’ licensing operations and services in alignment with RTA rules and regulations.

The primary objectives of DLD are:



Manage driver licensing operations and services across all customer categories.



Conduct examinations for all drivers applying for licenses and permits for every vehicle type and category.



Issue and renew → drivers’ licenses, including professional, private, and heavy vehicle drivers.



Validate and update driver data to ensure accuracy and completeness in the system.



Continuously review and innovate licensing services to enhance customer experience.

1.6. Smart Traffic System and the Challenges

Currently, the vehicle licensing services are managed through the Smart Traffic System across multiple channels (FTF, Online, Mobile, Kiosk, Trusted Agents), the VLD & DLD licensing services were designed based on a service-oriented approach.

It was developed using N-Tier Architecture on Oracle Database layer, and Business Rules defined using J2EE which facilitates the process of building business rules and procedures, and enables the final implementation of Oracle iAS 12c Application Server through Enterprise JavaBeans (EJBs) that guarantee smooth integration between applications with room for scalability and distribution to deploy the system on any Application Server, and a presentation layer built using JSP technologies, it covers the following system components:

01. System Management

02. Drivers Technical Test System

03. Drivers Licensing System

04. Vehicle Registration System

05. Special Plate Numbers System

06. Fines Management System

07. Commercial Licensing System

08. Reports and Inquiry System

09. Product Delivery Management

1.6.1. Stakeholders

Internal Stakeholders

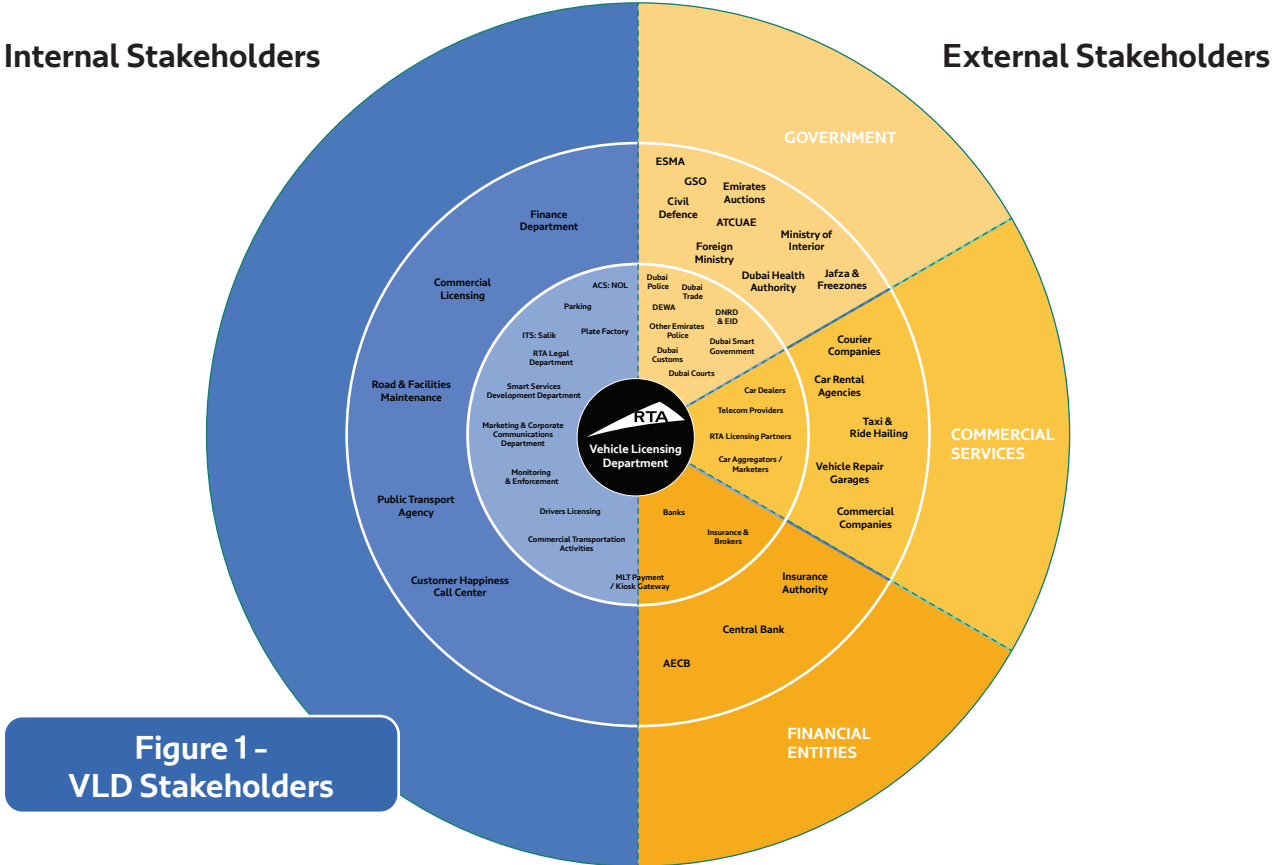


Figure 1 -
VLD Stakeholders

Internal Stakeholders

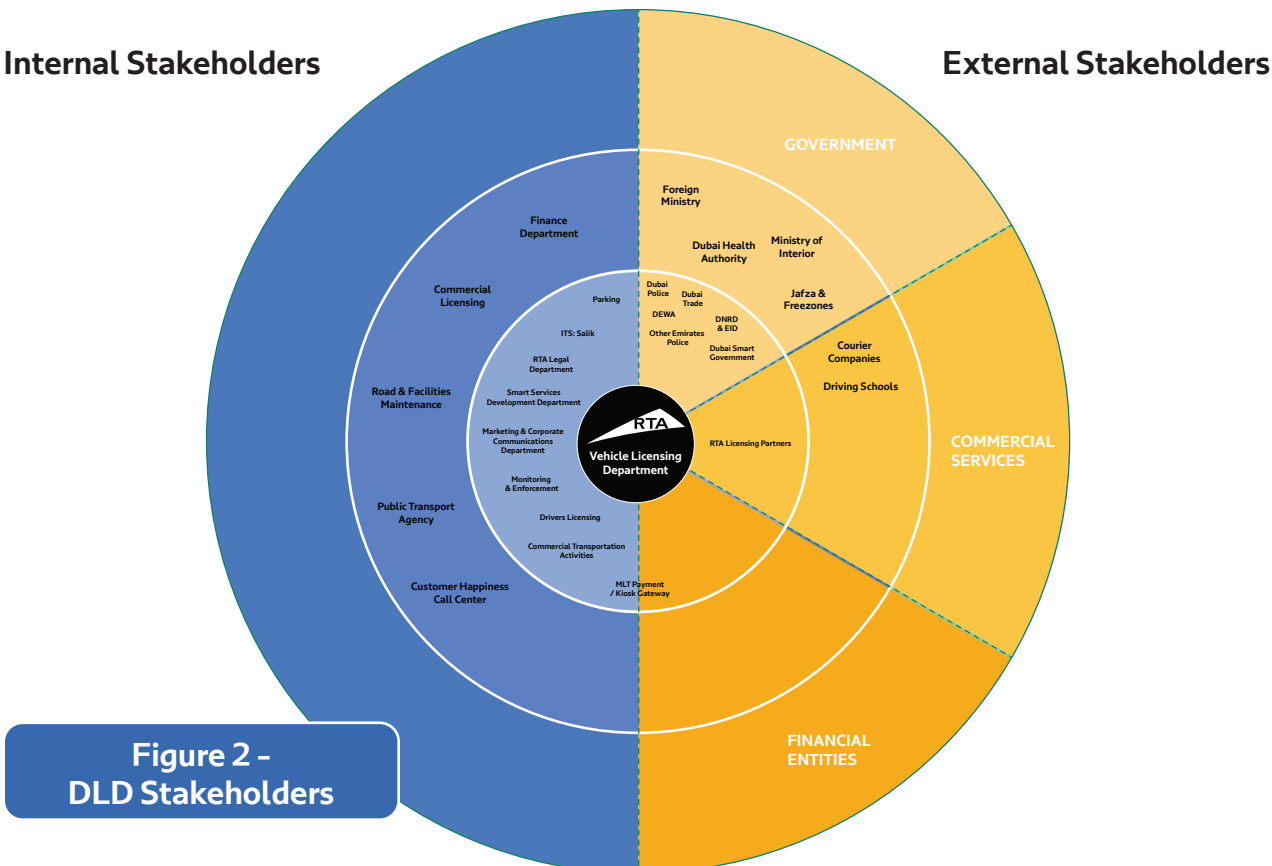


Figure 2 -
DLD Stakeholders

1.6.2. Business Challenges

- The Vehicle & Driver license services are built based on a service-oriented approach.
- The Vehicle & Driver license services are presented independently, directly from RTA to the customers without engaging partners like (New vehicle dealer, used vehicle dealer, driving schools, etc.)
- The current VLD services do not apply a customer-centricity strategy.
- VLD & DLD Services were not aligned with RTA's Digital Transformation strategy.
- VLD & DLD Services were not aligned with the Dubai 360 strategy.
- RTA's partners (e.g., New vehicle dealers, Used vehicle dealers) can't integrate with the current VLD system because it is not in line with the RTA partners' vision and objectives.

1.6.3. Technical Issues

- Legacy System Dependencies: Reliance on old platforms that limit scalability, cause performance bottlenecks, and complicate modern upgrades.
- Integration Complexity: Difficulty in synchronizing data due to varying standards and legacy systems.
- API & Data Exchange Issues: Frequent mismatches in API specifications, payload structures, or real-time synchronization leading to delays in services.
- Performance & Scalability: System slowdowns during peak traffic (license renewals, fines payments) leading to poor user experience.
- Security & Privacy Concerns: Ensuring sensitive citizen and vehicle data is protected during multi-entity data exchange.
- User Experience Gaps: Complicated flows, inconsistent interfaces, and lack of mobile-first optimisation impacting adoption.

2. DX- Vehicle & Driver Licensing Systems (VLS/DLS)

Aligned with RTA's Digital Transformation strategy, a next-generation solution has been conceived – a comprehensively designed, future-proof system built for scalability, resilience, and adaptability to meet both current and evolving demands.

The newly engineered system embodies the following strategic pillars:



Innovation:

Adoption of innovative services by creating new creative services that meet the customer demands and facilitate the customer journey, and adoption of the new technologies (such as Microservices, Kafka, etc.), and is capable of integrating and implementing new technologies in the market (such as Artificial Intelligence / Machine Learning, Blockchain, etc).



Agile Delivery:

Accelerated and flexible delivery of services, features, integrations, and actionable insights.



360 Integration:

Integration of the system with other governmental and non-governmental entities for efficient, secure, and reliable data exchange to enhance the customer journey.



People Happiness:

Human-centric design ensuring engaging, intuitive experiences for employees, partners, and customers.

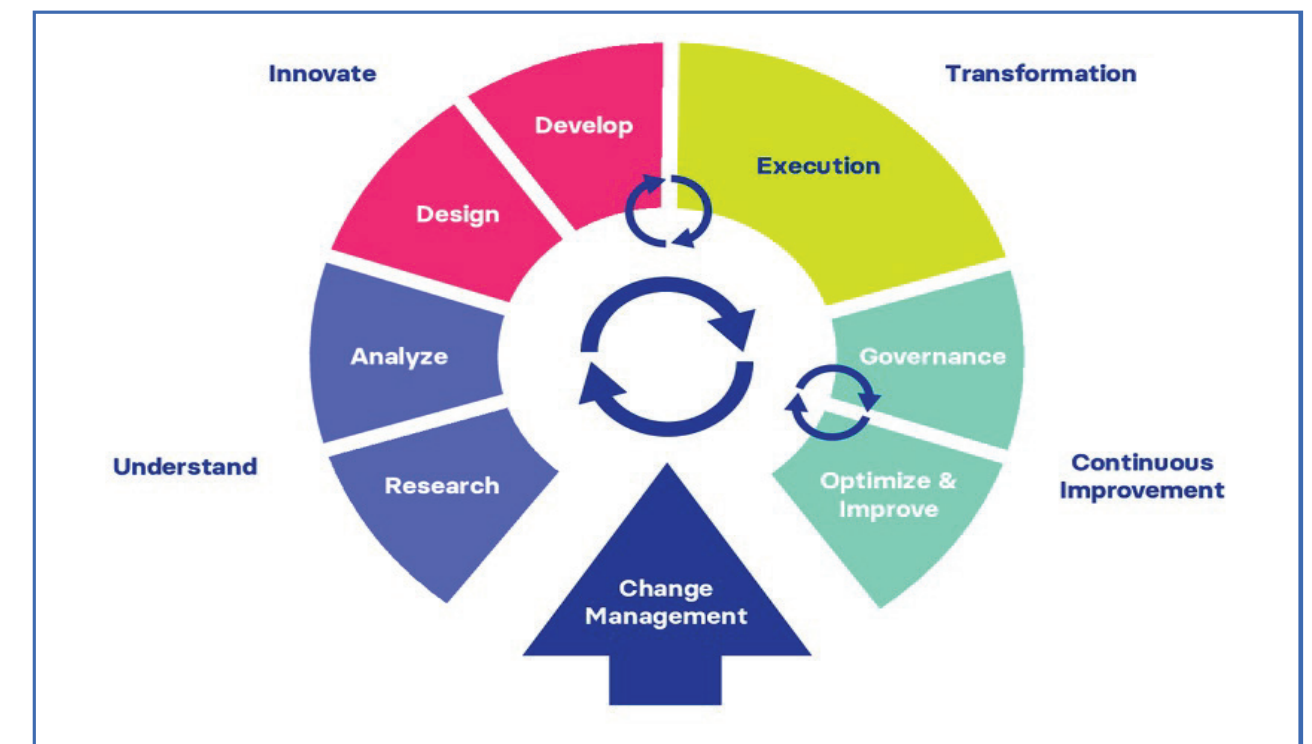


Sustainability:

Ensuring long-term continuity and resilience through optimized cost, robust cybersecurity, scalability, and new business opportunities.

3. Digital Transformation Life Cycle

The Digital Transformation Life Cycle provides a structured and continuous framework to modernize systems and deliver sustainable value. It enables organisations to move from understanding current challenges to innovating, executing, and optimising solutions. By applying this cycle with an **Agile approach**, RTA ensures faster delivery, adaptability to change, continuous stakeholder engagement, and alignment of technology initiatives with strategic objectives.



Understand:

- Research: Gather insights on current systems, user needs, and market trends to identify opportunities and gaps.
- Analyse: Evaluate the findings, define pain points, and prioritise areas for improvement.



Innovate:

- Design – Create solution blueprints and user-centric journeys aligned with business objectives.
- Develop – Build and configure applications, services, and integrations based on the approved design.



Transformation (Execution):

- Sprint Planning – Define scope, prioritise backlog items, and plan deliverables for each iteration.
- Design & Development (Build) – Iteratively develop features, integrations, and enhancements with continuous collaboration between business and technical teams.
- Testing & Validation – Conduct unit, integration, and user acceptance testing within each sprint to ensure quality and compliance.
- Deployment – Release increments frequently into staging or production environments, enabling faster value delivery.
- Review & Feedback – Demonstrate completed features to stakeholders, gather feedback, and adjust the backlog accordingly.
- Retrospective & Improvement – Reflect on each sprint to identify lessons learned, optimise processes, and improve team efficiency.



Continuous Improvement:

- Governance – Apply structured oversight, compliance checks, and quality controls to ensure alignment with standards.
- Optimise & Improve – Continuously enhance performance, scalability, and user experience through monitoring and feedback loops.



4. New Vehicle Licensing System (VLS)

There are four main products in the Vehicle Licensing Department

- Vehicle License (i.e., Register a Vehicle, Vehicle Renewal, etc.)
- Vehicle Certificate (i.e., Export Vehicle, etc.)
- Plate Number (i.e., Buy Plate, etc.)
- Metal Plate (i.e., Lost/Damaged Plate)
- Supported products: which are used to issue the above main products:
 - Insurance Policy
 - Inspection Certificate
 - Mortgage
 - VLD Permits (i.e., CTA permits, Civil Defense permits, Glass tents permits)
 - Reports (i.e., Clearance Report...)

1. Vehicle License Product (Services):

The target is to rebuild all these services based on product and customer journeys and streamline them into just four services. The existing services were originally designed for individuals and standard corporates, but now they will be adapted for the Transport Corporation domain, which has different requirements and experiences. This approach will simplify the licensing business, separate CTA business from vehicle licensing through the application of permits, and enhance overall efficiency. These services are:

- Register a Vehicle
- Renew a Vehicle
- Sell a Vehicle
- Update License Info

2. Vehicle Certificate Product (Services):

The target is to rebuild all these services based on product and customer journeys, and to streamline them into just four services. The current services were originally designed for individuals and standard corporates, but now they will be adapted for Transport Corporates, who have different needs and experiences. This approach aims to simplify the licensing process, separate CTA business from vehicle licensing by applying permits, and make the overall service offering more efficient. The four services are:

- Possession Certificate
- Export Certificate
- Declaration Certificate
- Import Certificate

3. Certificates Product (Services):

- Tourism Certificate
- Vehicle(s) Clearance Certificate
- Vehicle Ownership Certificate
- Non Ownership Certificate
- Insurance Refund Certificate
- To Whom It May Concern Certificate
- Replacement of Lost/Damaged Possession Certificate
- Return From Tourism
- Issue Special Certificates
- Printing Registered Vehicle Report
- Vehicle Status Report

4. Plate Number & Metal Product (Services):

The target is to have separate plate products (Plate Number, Metal Plate) with their services to be built based on product and customer journey, and to be minimised to just six services, these services are:

- Plate Number Services
 - Buying, Selling, Reserve a Plate Number
- Metal Services
 - Change The Metal Plate Design
 - Lost/Damaged Plate
 - Request an Additional Plate



5. Vehicle Permits (Business Component):

The target is to establish a new business entity to manage all permit-related services required in specific cases during vehicle licensing. These permits will be issued through a defined set of 38 business processes, based on the vehicle’s purpose and other conditions. Each permit will cover the necessary information to be applied effectively throughout the customer journey. The permit will cover the following information when it is used during the journey:

- Licensing Conditions (ex: Purpose Type, Plate Category, etc.)
- Collecting an Extra Fee for The Permit Issuer
- Allowed Vehicles for Licensing
- Insurance Constraints
- Inspection Constraints

6. Insurance Policy (Business Component):

The target is to complete the remaining business functionalities with new features related to product providers through system integration, and to enable insurance aggregators within the VLS platform to allow customers to claim new insurance policies during vehicle licensing. These components are:

- Submit a New Insurance Policy
- Update an Insurance Policy
- Cancel an Insurance Policy

7. Mortgage (Business Component):

The target is to complete remaining business functionalities with a new feature related to the product provider through the integration; these components are:

- Prepare a Bank Mortgage Request
- Add a New Mortgage
- Cancel an Existing Mortgage
- Release a Mortgage
- Cancel a Mortgage Release

5. Enabling RTA Partners with Vehicle License Services:

RTA’s objective is to enable these partners on RTA license service through the digital platform which is aligned with the partner’s business and serves the customer.



New Vehicle Dealer

RTA has a relationship with 13 car dealers who own many vehicle brands, where most of the customers start their journeys through them, so enabling a centralised platform for them will have the following advantages:

1. Facilitate the customer journey and reduce costs and efforts to enhance customer satisfaction.
2. Increase the relationship between RTA and the Vehicle dealer in alignment with RTA’s main principles.
3. Facilitate and expand partner business.

The features provided to the new vehicle dealer will be expanded based on their requirements and the agreement:

- | | |
|--|---|
| 01. Declare an imported vehicle, especially when it is not entered into the UAE | 02. Define a new vehicle model at RTA because they are brand owners and trusted |
| 03. Declare imported vehicles, especially when they are not entered into the UAE | 04. Selling their declared vehicles |
| 05. Issue a new License for the declared vehicle | 06. Export a declared vehicle |
| 07. Issue a Proof of Ownership | 08. Using Licensing Agency (LA) data |
| 09. Using Insurance Features | 10. Using Mortgage Features |

6. New Driver Licensing System (DLS)

The new Driver Licensing System (DLS) will restructure services based on product and customer journeys, streamlining them into simplified journeys and adapting them for both individual and corporate domains. This will increase efficiency, ensure compliance with regulatory requirements, and provide a more seamless and customer-centric experience.

6.1. Driving Test & Appointment Management (Services)

The target is to streamline all testing-related services into a unified product journey, covering the full lifecycle of knowledge, evaluation, and road tests. The journey **“Apply for Booking or Changing a Driving Test Appointment”** include:

- Apply for Booking a Driving Test
- Apply for Booking an Evaluation Test
- Apply for Changing a Driving Test Appointment

6.2. Driving License Product (Services)

The target is to rebuild licensing services based on customer journeys, unifying them into a streamlined structure that adapts to both individuals and transport corporates. The journey **“Apply for or Manage a Driving License”** include:

- Apply for a Learning Permit
- Apply for a New Test-Based Driving License
- Apply for Adding a New Category Based on Test
- Apply for Amending a Learning Permit
- Apply for Renewing a Driving License
- Apply for Replacing a Lost/Damaged Driving License
- Apply for Female Training Permit
- Apply for Driving License Re-issuance

6.3. Exchange & Transfer Licensing (Services)

This product covers services for customers who hold valid licenses from other countries or Emirates and wish to exchange them for a Dubai-issued license. The journey **“Apply for a New Driving License & Adding New Category Based on Exchanging Licenses”** include:

- Apply for a New Driving License Based on Exchanging Licenses
- Apply for Adding a New Category Based on Exchanging Licenses

And, the journey **“Apply for Transferring Driving Profile From or To Dubai”** includes:

- Apply for Transferring a Driving License From or To Dubai
- Apply for NOC to Transfer a Learning File

6.4. International Licensing (Services)

This product enables drivers to obtain recognition of their Dubai-issued license internationally through a simplified service. The service is:

- Apply for an International Driving License

6.5. Driver Certificates (Services)

The target is to consolidate certificate issuance services into a dedicated product line, ensuring easy access for customers requiring proof of experience or status. The journeys **“Apply for a Driver Experience Certificate”** are:

- Apply for a Driver Experience Certificate
- Apply for a To Whom It May Concern Certificate

6.6. Special Permits (Services)

The target is to establish a dedicated journey for all special driving permits to support tourism, occupational, and specialised transport domains. These services will be rebuilt to support individuals, corporates, and transport companies. The journey “**Apply for a New/Renewing/Amending Special Driving Permit**” include:

- Safari Driving & Learning Permits
- Tram Driving & Training Permits
- Vehicles of Special Nature Driving Permits
- Occupational Driving Permits
- Delivery Driver Qualification Certificate
- Electrical Scooter Driving Permit
- Permit Amendments
- Appointment Management
(booking/changing knowledge, practical, and special test appointments)

6.7. Testing Sites & Inspections (Business Component)

The target is to regulate and manage the testing sites for vehicles of special nature and other domains through specific permits and inspection journeys. These journey “**Apply for Inspecting Driving Tests Sites for Vehicles of Special Nature**” include:

- Apply for Inspecting Driving Test Sites
- Apply for Renewing Driving Test Sites Permit
- Apply for New Driving Test Sites Permit

6.8. Road Test Appeal (Services)

To ensure fairness and transparency in the licensing process, DLS includes a dedicated service for appealing test results:

- Apply for Appealing Road Test Results



7. DX Evolutionary Architecture

The Licensing 2.0 system aims to create distributed systems to serve different business departments such as drivers' licensing, vehicle licensing, and commercial licensing, and align all the new services with the Licensing Agency's (LA) digital transformation vision.

The Vehicle Licensing System aims to reengineer existing services and processes and create end-to-end integrated customer journeys to eliminate the required documents for the Vehicle Licensing Department (VLD) and Drivers Licensing Department (DLD) services to be available across RTA smart channels. The new journeys will also utilize various capabilities, such as the UAE Pass for digital signature and digitized customer identity. The system will be flexible enough to expose the newly re-engineered journeys for external entities through a set of APIs that can be utilized by other parties.

7.1. Advantages:

1. Modern Microservices-Based Design

- Shifts from monolithic to **microservices architecture**, improving flexibility and scalability.
- Services are **loosely coupled and independently deployable**, reducing risks of full-system failures.
- **Single Responsibility Principle (SRP) and Domain-Driven Design (DDD)** ensure each service is focused and maintainable.

1. Enhanced Integration and Interoperability

- Provides **API Gateway & Backends-for-Frontends (BFF)** patterns, allowing seamless integration with multiple channels (RTA portal, mobile apps, kiosks, call centers).
- Supports **integration with government & non-government systems** enabling real-time data exchange.
- Uses **event-driven messaging** for asynchronous and reliable inter-service communication.

3. Reliability, Resilience, and Monitoring

- Implements **circuit breakers, load balancers, and service registry/discovery**, ensuring high availability and fault tolerance.
- Provides **real-time monitoring, distributed tracing, log aggregation, and exception tracking** to quickly detect and resolve issues.
- Built-in **disaster recovery, backup & recovery, and scalability mechanisms** improve system robustness.

4. Improved Customer and Business Experience

- Re-engineers journeys for **driver, vehicle, and commercial licensing**, minimising paperwork and enabling **digital signatures (UAE Pass)**.
- Offers **end-to-end customer journeys** across RTA smart channels, reducing customer friction and wait times.
- Allows external entities (banks, insurers, etc.) to **reuse APIs**, extending services beyond RTA platforms.

5. Strong Security Framework

- Adopts OAuth2, JWT, and a centralised UAA server for secure authentication and authorisation.
- Provides fine-grained access control and compliance with enterprise-grade security standards.

6. DevOps and Agile Delivery

- Supports **CI/CD pipelines, automated testing (unit, integration, performance), and DevOps practices**.
- Enhances delivery speed, ensures higher-quality releases, and enables **continuous improvement**.

7. Technology Flexibility and Future-Readiness

- Supports language neutrality (Java, Python, etc.) and hexagonal architecture, making it adaptable for evolving needs.
- Built on OpenShift/Kubernetes with containerisation, ensuring scalability, portability, and cloud-readiness.
- Incorporates IBM BPM & Decision Manager for business automation, enabling faster updates to rules and processes without deep IT involvement.

Figure 3 - Conceptual View

