



Case study

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Upgrade of Dubai **Al Ain Road**

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RTA Background Brief History

The Roads and Transport Authority (RTA) was established by the decree number 17/2005 in November 2005. According to that decree, RTA is responsible for planning, design, operation and maintenance of public transport, roads & traffic systems in the Emirate of Dubai, between Dubai and other Emirates of the UAE and the neighbouring countries. Since its establishment, RTA has adopted a challenging vision and Mission to effectively contribute to Dubai's vision & serving the vital interests of the Emirate.

RTA works towards achieving the vision of providing "The World leader in seamless and sustainable mobility" and RTA's mission is to "Provide seamless and safe travel with innovative, sustainable mobility solutions and services to make every journey in Dubai a world-class experience."



Organizational Structure

RTA's organizational structure (Figure 1) shows that RTA adopts the "Agency Model" which aims at providing flexibility in running work and separating regulatory issues from operational Issues each Agency / a CEO, who is a member of RTA's Executive Board that governs the organization and takes strategic decisions, leads Sector. This project was managed by RTA's Traffic and Roads Agency.



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Upgrade of Dubai-Al Ain **Road Project**

Introduction

The project is divided into two separate packages namely:

- to Emirates Road



Dubai-Al Ain Road is one of the most important roads extending up to 17 kms within the Emirate of Dubai.

• Package 1A - from Bukedra interchange to Sheikh Mohamed bin Zayed Road

• Package 1B - from Sheikh Mohamed bin Zayed Road

Background and Purpose

The project contributes to the enhancement of the road capacity, ease out the traffic congestions, reduction of journey time, and strengthening connectivity with surrounding major highways/arterial roads as well as serving existing and future development projects on both sides of the Dubai-Al Ain Road. The number of beneficiaries of the project is estimated to be around 1.5 million persons.

The project aims to attain the following objectives:

- Secure uninterrupted flow of traffic at major intersections by introduction of flyover/ bridges and underpasses.
- Increase the total capacity on bridges at the intersections in all directions to about 36.000 vehicles/hour.
- Achieve smooth traffic flow by doubling the capacity of the road from 6,000 vehicles/hour to 12,000 vehicles/hour.
- Reduce the journey time along the project boundaries from 16 to 8 minutes.
- Resolve traffic congestion problems extending up to 2 kms at all intersections within the project boundaries.

Project Scope

The project comprises of Development of 6 main intersections in addition to the widening of Dubai-Al Ain Road from 3 lanes to 6 lanes in each direction and service roads on both sides to serve the existing and future development projects and to serve the local communities on both sides of the road.

The project consists of the construction of the following:



29 Bridges with a total length of 5,938 meters (Lane length-14,980 meters).



12,100 meters of MSE wall/ramp.



10 new underpasses.



Upgrade of 17 kms of Dubai-Al Ain Road from 3 lanes to 6 lanes with a total lane length of 414 kms.



Upgrade of 4 Roundabouts to signalized junctions and Right In/Right Out access intersections.



The project also includes installation of signage and pavement marking, street lighting, irrigation ducts, diversion and/or protection of services and landscape works all along the Dubai-Al Ain Road.

Project Implementation

Schedule Baseline – Contract R1020/1A & 1B



Project Team Structure

The project team high level structure is presented, including the Client (RTA), the Design and Supervision Consultant and Contractors.



Package A







Construction and Relocation of Existing **Services Lines**

The project contains relocation of all types of utilities including wet utilities, dry utilities and telecom services varies from main distribution lines to small distribution lines and connections located on both sides of the roads along the 17 KM length of the project network, in addition to multiple utilities crossing under the road.

The scope of work had to be studied carefully through close coordination with services authorities to carry out the relocation services without disturbing the construction of road and bridge works, without interrupting the continuity of the existing services. in addition, Utilities crossings were constructed using a combination of different methods such as open-cut and NDRC (Non Destructive Road Crossing) to maintain smooth traffic flow during the course of the project while optimizing the use of the project budget.

Demolition and Reconstruction of Bridges within **Hight Traffic Roads**

Maintaining free and safe traffic flow during demolition and execution of bridges works over within high traffic roads.

Demolition and reconstruction of existing Bridges, while maintaining the same number of operating lanes and traffic flow over and under the bridge represented a considerable challenge.

This challenge was mitigated by the following actions:

01

The client representative (RTA Team) provided constant support and monitoring during Bridge Demolition works.

02

Consultant and Contractors prepared in coordination with RTA team specific Execution Plans, Logistic plans, Risk Plans, Health and safety plans, construction method statements.

03

Traffic and personnel safety conditions were closely monitored by both the consultant and client on 24x7 basis by dedicated Health and Safety Teams.



Nad Al Sheba Bridge

and Reconstruction of SMBZ Bridge



Maintaining Rate of Progress During **COVID-19** Pandemic

Restrictions on movement of goods and people, social distancing and interruption of global supply chains all presented significant challenge to the progress of work. This challenge was mitigated by adopting a high level of flexibility in design to accommodate the resulting delays and to maintain the required rate of progress, such as:



Increasing the number construction joints in the Bridge to accommodate the limitations on construction time.



Procuring bridge bearings via Air Freight.



Maintain multiple work shifts to accommodate restrictions imposed by the additional safety measures (as per Guidelines on movement and social distancing laid down by UAE Authorities).

Ensuring Safe Environment for Workers and the Public

Working adjacent to a live traffic

Working adjacent to live traffic requires strict compliance with local regulation in respect of traffic, safety, security etc. Operators and workers were carefully trained to handle all situations.

Work areas were protected by concrete barriers in accordance with the work zone traffic management guidelines. Green Mesh was also installed in some areas to conceal the working places and safe pedestrian access were also provided. Flagmen were deployed at areas of high risk to warn road users (motorists & pedestrians) of impending dangers.

As a result of the above mitigation factors, the project achieved 20.92 million man-hours without Loss Time Injury (LTI) on the project, ensuring safe environment for the workers and the public.













Flexibility

Flexibility for adjustments to design/scope changes.

The design/scope changes were well synchronized in a manner to maintain the ongoing project execution and avoid a change to the rate of progress or to the project completion date. For example, a New Bridge was included in the project as per the requirements of a developer during project execution. This variation to the scope of work was accommodated within the project timeline without effecting the original project completion date.

Collaboration of Stakeholders

Continous engagement of all stakeholders including Client's top Management had been crucial for the success of such large scale project, which allowed for quick critical decision-making during various stages of project execustion.

01

Periodical forum meetings were held with the participation of top Management of RTA, the Consultant, and the Contractors to review the project status. Many strategic decisions were taken during these meetings in terms of budget, schedule, design change, traffic management, etc. which eventually benefited the interests of all stakeholders.

02

RTA supported the contractors to obtain the required critical and time-sensitive Approvals/NOCs from different Government entities.

Reacting to COVID-19 Pademic

Flexibility of adjustment of project execution plans was the key to managing the project risks during the COVID-19 Pandemic restrictions.

While strictly adhering to Rules and Guidelines of UAE Government and coping with restrictions all over the world, the project team adjusted their work schedule, including the following:

01

Due to social distancing guideline & traveling limitations on number of personal/per vehicle within UAE, Project Execution Plan was revised from one shift to multiple shifts per day to maintain planned resources engagement, while adhering to the COVID-19 guidelines.

02

Project long lead items like Bridge Bearings which had to be imported from European countries were severely affected in terms of manufacturing and shipment, which has risked ongoing execution of Bridge works. To mitigate this risk and maintain progress rate, design changes were introduced for all Bridges by introducing additional construction joints, which helped to execute majority of bridge scope without awaiting delivery of the bearing. Less priority lots of bridge bearings were delivered via air fright to save time instead of original plan for delivery standard shipments.

03

To benefits form the reduced traffic levels during the COVID-19 pandemic, from the traffic management plans were adjusted to allow multiple and simultaneous traffic diversions and larger work zone areas compared to what is usually applied in normal scenarios, which helped in mitigation of delays resulting from COVID-19 restrictions.

Timely Completion of Additional (Out of Original Scope) Request

Adopting agile methodology to accommodate the new requirements was a key factor for customer satisfaction and improved project control.

During the project, a new directional ramp crossing the Dubai-Al Ain road was requested by a developer. The project team managed to revise the project project of work to include the new requirements within the original scope without disturbing the original scope progress and maintaining the final completion date of the project unchanged. This was achieved by fast tracking project activities and redistribution of the existing resources.

Close Coordination with all Services Authorities

Continuous coordination with services authorities starting from design phase until project hand over, allowed to mitigate potential risks related to possible delays in Services authorities' approvals. This was achieved via continuous early coordination and involvement of relevant service authorities, for example:

01

During design phase, all requirements were timely incorporated during the final design in coordination in advance with all relevant services authorities.

02

During construction phase, all execution drawings and shutdown dates for utilities were coordinated and agreed in advance by relevant services authorities, which minimized the disruption to construction activities.

Project Cost Saving Resulted from Value Engineering

Project cost saving was achieved during both design and construction phases of the project.

The following represents some examples of the vlalue engineering efforts:

01

During the design phase, pot bearings were replaced by spherical bearings resulting in reduction in maintenance cost.

02

During Construction phase, bridge ramps were replaced with soil walls in selected areas, where applicable, resulting savings in the construction cost.

03

Through collaboration with other projects within RTA portfolio, excess fill material from other projects were directly utilized in the project.

Keys to Success

The following represents the key factors that contributed to project success:

- Top Management Involvement
- High level of agility to handle changes
- Prioritizing Safety requirements
- Managing Risks & issues in Timely manner
- Efficient Progress Monitoring and Project Control
- Early coordination and effective continuous collaboration with stakeholders
- Engagement of Specialized Professionals whenever required
- Flexible Traffic Management Plans

