

Case Study

Transport Capacity and Demand Modelling for Doha supporting FIFA World Cup

The sovereign state of Qatar successfully hosted the 22nd FIFA World cup football tournament in the penultimate months of 2022.

As part of the strategic event planning the host nation identified the need to secure assistance from a suitably qualified and experienced organisation to evaluate, predict and where necessary provide real-time solutions and mitigation strategies in relation to the supply capacity and predicted demand for the Doha transport network during the event.

The Challenge

The award of the tournament to the State of Qatar by FIFA was ground-breaking both in terms of this being the first FWC to be held within the Middle East but more acutely significant being the decision to develop, build and manage the necessary tournament infrastructure (stadia, Hotels and Public transportation network) all within a single City half the size of London.

Additional challenges to the project from an Infinitive Group perspective included the timeline for delivery (IGL were engaged 5 months prior to the events opening game) and the status (availability or non-availability) of existing technology data sets that would assist to integrate and develop real-time alarms and triggers enabling the roll-out of prepared and rehearsed mitigations. Additionally, with the eyes of the world focused on Qatar as the curtain raiser approached, IGL also had to embrace and overcome frequent changes to cloud-based Infrastructure procedure and process regarding Cyber-Security measures as stipulated by the organising committee.

Our Solution

In delivering the project IGL worked collaboratively with the Central Doha Operations Teams (e.g., Supreme Committee, Qatar Rail, RKH Qitarat, Ministry of Transport, and the Ministry of Interior) within an agile project methodology revolving around the three pillars of:

- **Discovery & Demand** Forecasting and predicting demand of the transport system during the 2022 FIFA World Cup.
- **Design** Utilising the findings from the discovery piece to establish trigger points providing a basis for interventions as a contingency for the operational network to dampen demand on the transport system.
- **Delivery** Surveillance and monitoring passenger movements during the 2022 FIFA World Cup using a real time view of the status of the transport network.

Infinitive Group assembled an experienced team to deliver the project consisting of:

- Agile Project Manager(s)
- Transport Planners
- Business/Data Analysts
- Data Scientists/Engineers
- Software Developers
- System Integration Engineers
- Transport Systems Subject Matter Experts

The transport study included overlaying the baseline traffic modelling with additional capacity requirements for the World Cup. Due to a heavy reliance on the information provided by the client and their partners the discovery process extended into additional work streams such as local crowd management plans with observed behaviours realised from other mass participation events.

Data was aggregated into all critical locations around the Central Doha transport system and provided a model of passenger movement and capacity of the road and passenger transport network, providing a basic passenger flow model.

For the project duration IGL communicated progress via two weekly updates presented to the Central Doha Operation Team and on occasion Government Ministers, detailing findings to date, early outputs, and recommendations.



The Results

Culminating in the Submission of three separately focused reports, all of which meeting the client's deadline, and 2000+ supporting modelling visualisations, Infinitive Group comprehensively captured and evaluated all travel routes for each World Cup match and activation Event (Fan Festivals).

These developed demand forecasts, combined with the designed capacity of the transport systems created a high-level foundation of the transport system supply and demand, highlighting potential choke points which would likely require operational or capital interventions to mitigate any system strain risk.

As a result of the report(s) and subsequent positive stakeholder review, IGL were further engaged to support the event by the rapid design, development, and deployment of Two additional work streams.

The first additional works involved a Queue management 'App' rolled out to Metro staff at each

Station entrance enabling real-time communication with the associated command and control HQ. The purpose of this system was to provide insight to the client's operation regarding external pressure on stations whilst also providing proactive information to the traveling public with 'live' queue timing information.

This was a recommendation which came out of the IGL supply and demand study, the purpose being to dynamically change the demand profiles through the influence and awareness of further travel choices.

The Second additional workstream required the rapid development of a scenario-based passenger simulation model to support the Metro operation through observation of key metrics identified by the client. As history now confirms the event from a transport perspective was a great success and In all instances IGL delivered under tight time constraints with the developed applications extensively used to great effect throughout the event.



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