

SPE & Bus/Emergency Priority



**Public Works Authority
Maintenance Department
ITS Section**

- 1) Why priority matters (strategic outcomes)
- 2) SPE concept & operating model
- 3) Deployment in Doha (bus + emergency)
- 4) Results, lessons, roadmap

Positioning

Priority as a policy-based
network operations capability

Executive takeaway

“SPE turns vehicle priority into an auditable, rule-based service that can scale across fleets and corridors.”

What this enables (leadership view):

- Faster emergency response and safer approaches to intersections
- More reliable FIFA bus operations (during FIFA World Cup event)
- Clear priority policy (who, when, where) with measurable outcomes
- Reduced disruption to general traffic through coordinated, corridor-aware control

Why vehicle priority matters

Emergency Response

- Reduce delay at critical junctions
- Improve approach safety
- Enable predictable travel times

FIFA Buses Reliability

- Reduce bus stops/starts
- Support schedule adherence
- Improve passenger experience

Event Operations

- Handle surges with policy control
- Protect key routes (stadiums, hospitals)
- Minimise network-wide disruption

Deployment snapshot (Doha)

Total SCATS sites

462

Signalised sites under SCATS control

Total SPE sites

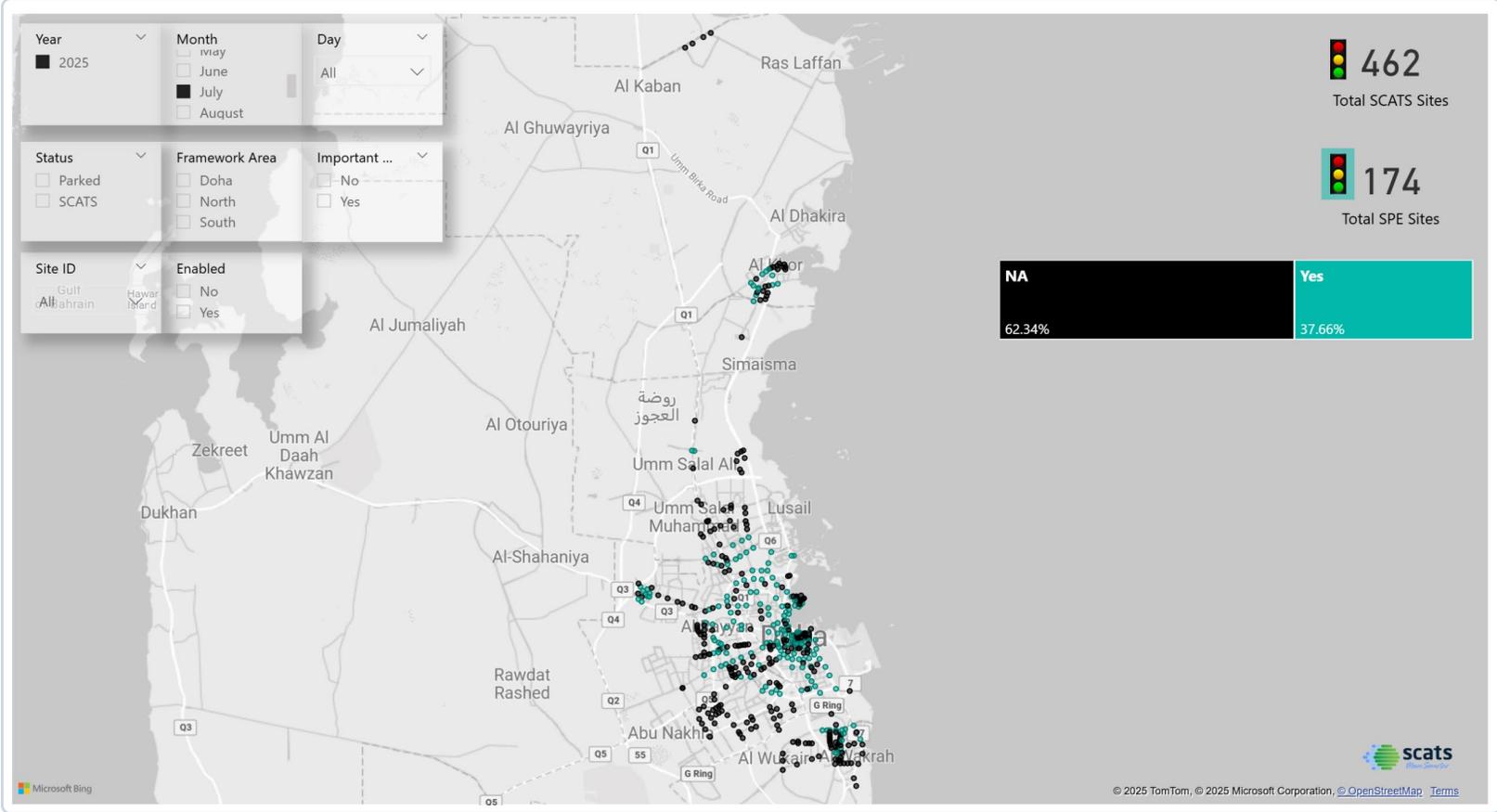
174

Sites enabled for priority handling

SPE coverage indicator

≈40%

Share of SCATS sites currently SPE-enabled



SPE/SCATS status dashboard snapshot (2025)

System architecture (V2I priority)

SPE integrates fleet tracking / dispatch systems with SCATS to deliver coordinated signal priority across a corridor or network — using shared rules and standard interfaces.

Project Ecosystem

SCATS

- Central Manager
- SCATS Regions
- Controllers

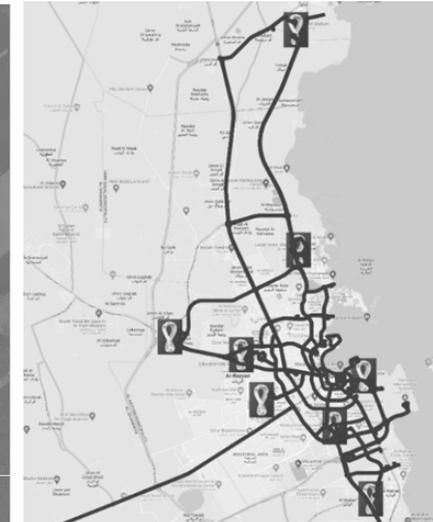
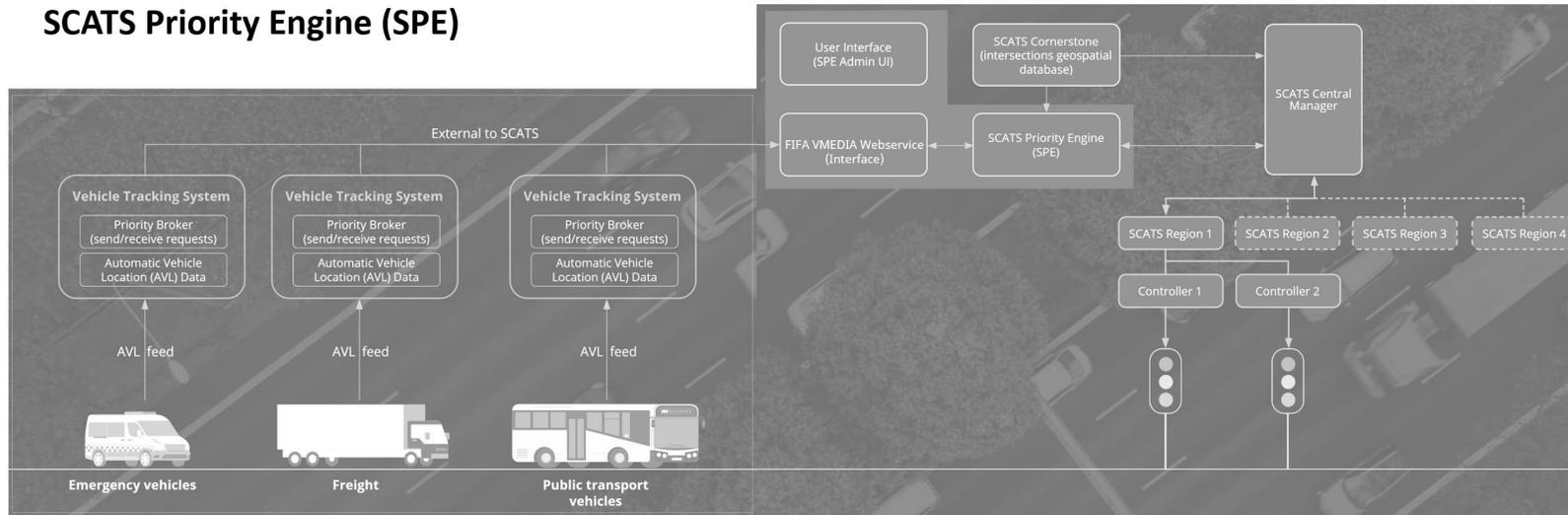
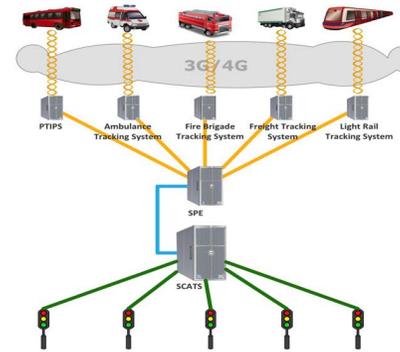
SCATS Cornerstone

SCATS Priority Engine (SPE)

Fleet Management Systems

- Vehicles
- Tracking systems

Interfaces



Bus priority use case: FIFA World Cup 2022

Objective

- Integrate bus fleet management with SCATS
- Provide bus priority at 150+ signalised junctions during the event
- Establish procedures and business rules reusable for future fleets

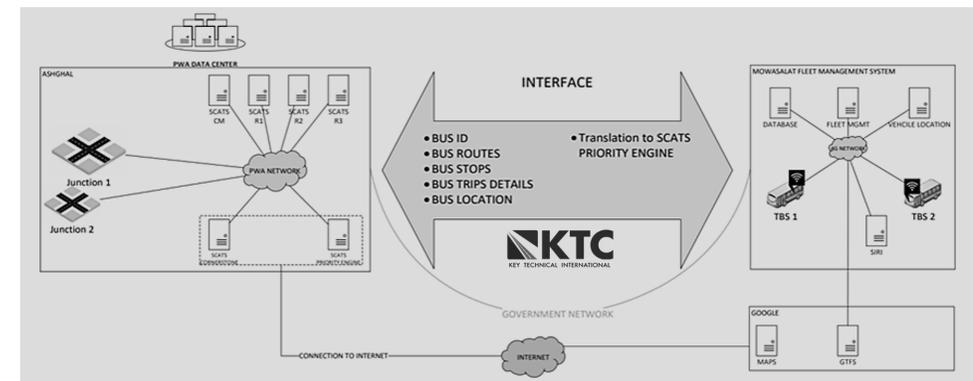
Integration approach

- Bus Fleet Management System (BFMS)
- Bus Priority Interface (BPI)
- SPE calculates priority action and instructs SCATS for coordinated green



Bus Priority Interface (BPI)

- Interface between the Fleet Management System (FMS) and SPE
- enables **Mowasalat** Buses to get priority at traffic signal when buses are approaching an intersection
- two main components which are:
 - BPI.MOWA to get data from MOWASALAT Fleet Management System (FMS), and
 - BPI.SPE to send/receive data to/from SPE Engine

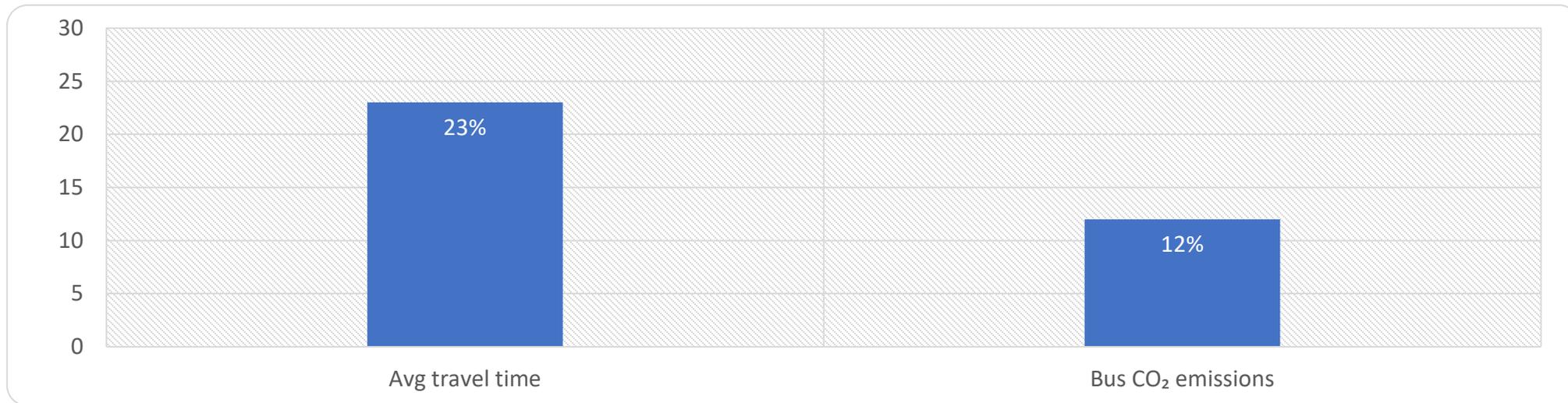


Bus priority results (FIFA operations)

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|--|--|--|
| Priority requests processed 11,395 Bus priority requests handled by SPE | Signalised intersections 150 Junctions enabled for event priority | Registered buses 327 Across 88 bus routes |
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Reported outcomes on key routes

Priority was used to reduce bus stopping and delay at signals, improving travel time reliability during the event period.



Percent reduction vs pre-event conditions

Event operations summary

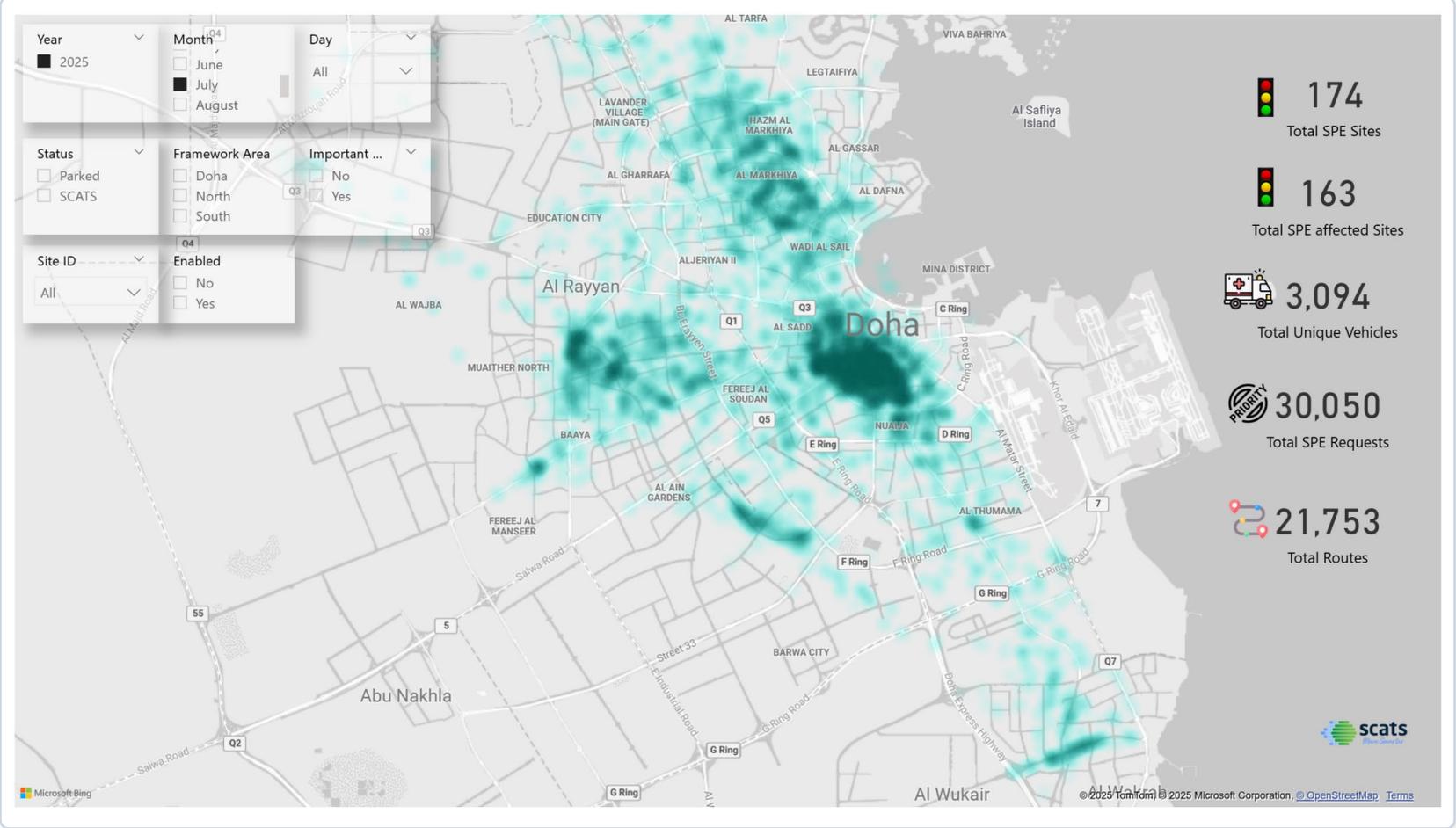
Emergency vehicle priority: operations snapshot

Reporting window
Jul 2025
Operational dashboard extract

Total SPE requests
30,050
Priority calls across the network

Unique vehicles
3,094
Emergency vehicles observed in the system

Sites affected
163 / 174
SPE sites with activity in the period

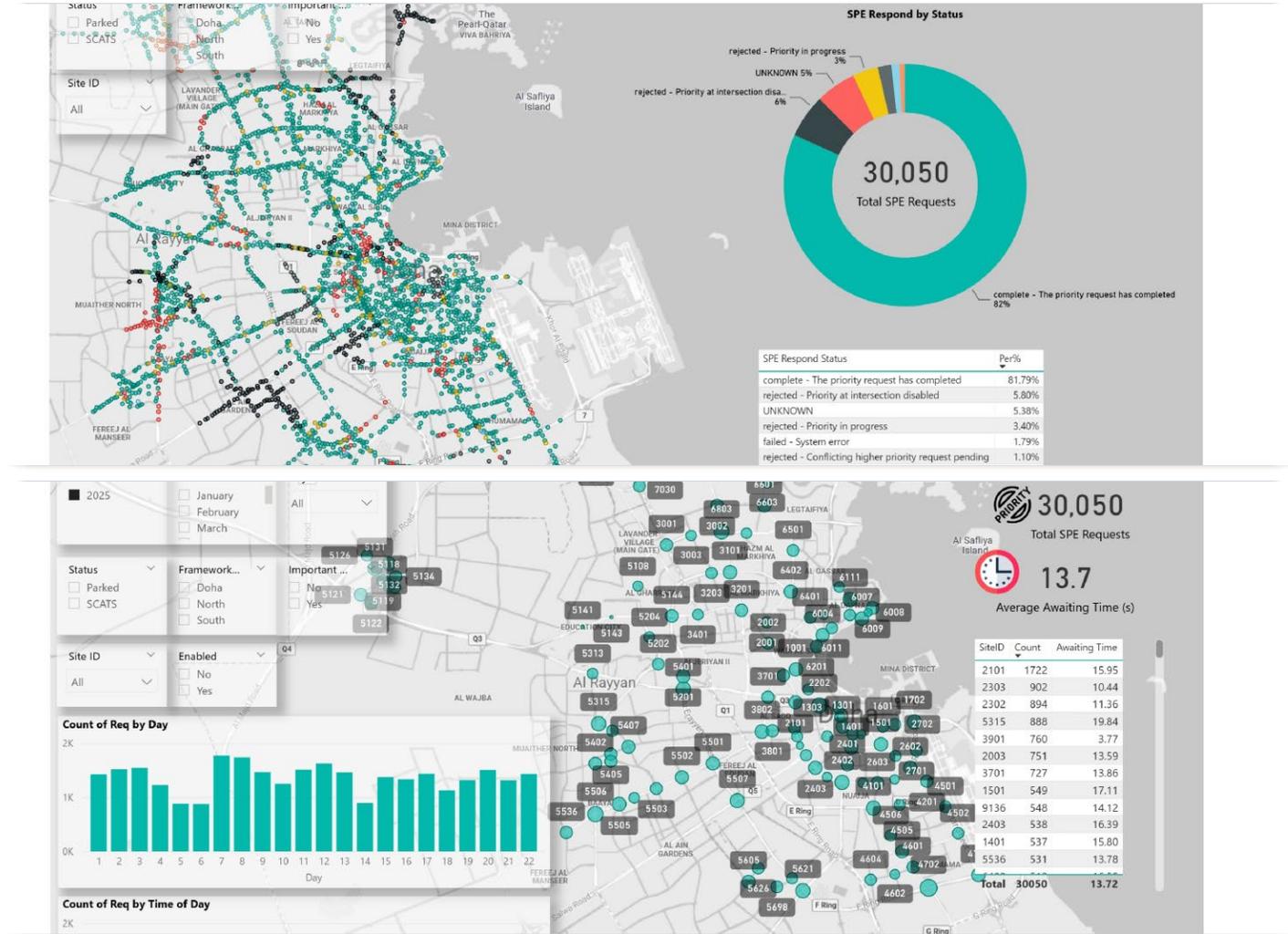


Service quality indicators (emergency priority)

Completion rate (share)
≈82%
 Requests completing successfully in the period

Average a waiting time
13.7 s
 Time between request and priority action

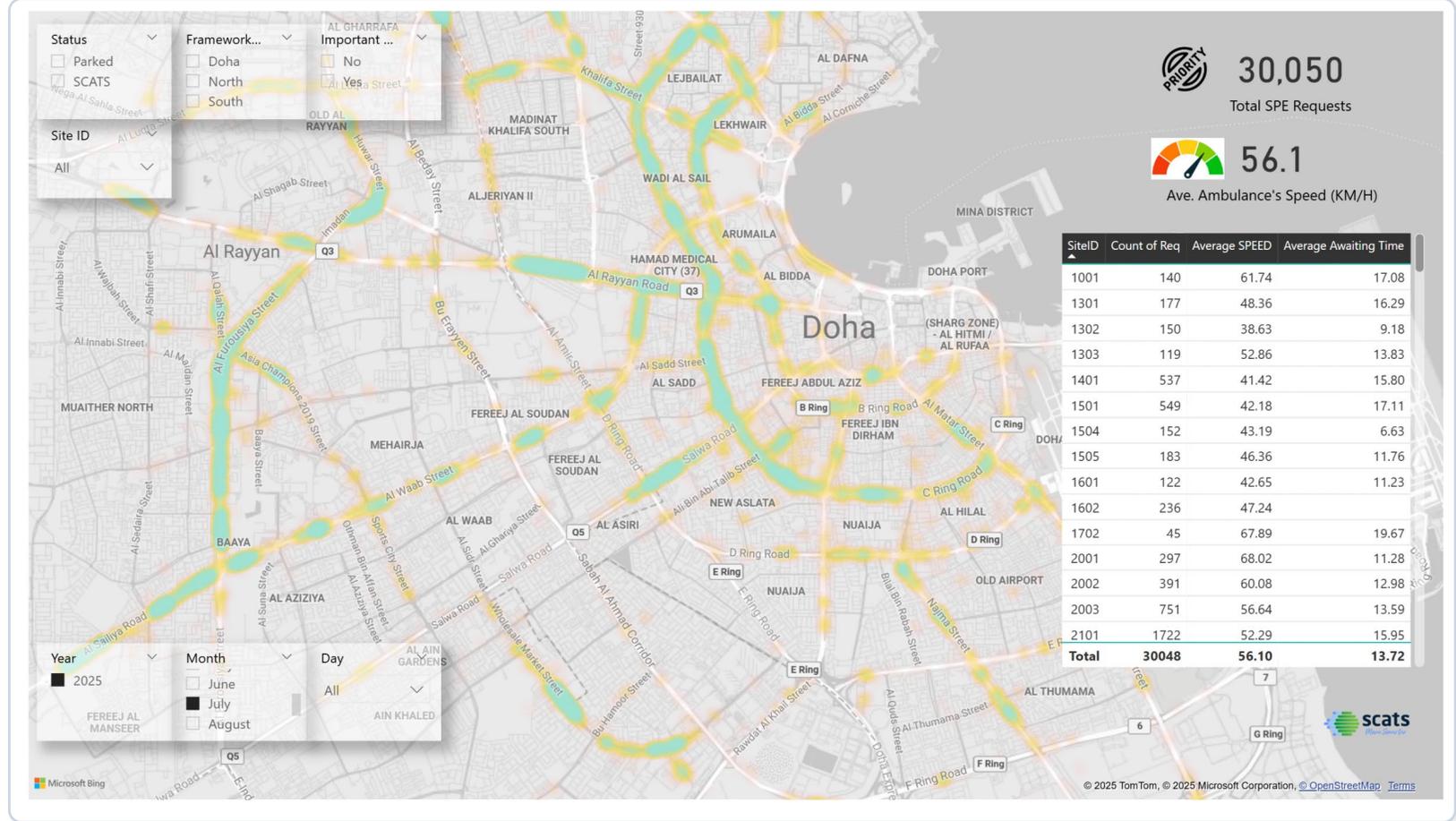
- Operational use**
- Monitor outliers (latency, failures)
 - Targeted site fixes (disabled intersections)
 - Policy tuning (recovery + conflict rules)



Operational indicator: observed ambulance speed

Average speed (period)
56.1 km/h
 Observed within SPE reporting window

- How it is used
- Track corridor performance for emergency response
 - Identify “slow segments” for targeted interventions
 - Validate priority policy effectiveness over time



Lessons learned (scaling priority)

Technical enablers

- Reliable comms (low latency; redundancy on critical corridors)
- Accurate positioning for V2I triggering (GPS accuracy is key)
- Standardised interfaces between fleet systems and SPE
- Monitoring: request outcomes + rejection reasons to drive fixes

Operational & policy enablers

- Clear priority policy (who/when/where; recovery rules)
- Stakeholder alignment (RMC, emergency services, operators)
- Change control for corridor rules and site configurations
- Continuous improvement loop using KPI review cadence

Roadmap & peer exchange (TfNSW)

The deployment of the **SCATS V2I system** for **FIFA Bus Transit** in Doha during the 2022 World Cup demonstrated:

- the potential operation of smart traffic management systems to handle large-scale events efficiently.
- By integrating V2I technology with SCATS, the system optimized traffic signal control and prioritized public transit vehicles, reducing congestion and improving travel times.

For Future:

- This successful implementation serves as a model for future smart city initiatives and demonstrates how advanced technologies can be leveraged to address urban mobility challenges during major events.
- By facilitating real-time communication between vehicles, infrastructure, and other linked devices, SCATS, V2X (Vehicle-to-Everything), and Cooperative Intelligent Transport Systems (C-ITS) technologies significantly will improve road networks.

Questions for TfNSW

- Priority policy governance: how do you manage corridor rules and exceptions?
- Emergency preemption: what KPIs and safeguards are standard?
- Bus priority: how do you balance reliability with general traffic impacts?
- Operational assurance: how do you monitor “quality of priority” at scale?