

ITS Inventory

ITS Element	Description
Archive	Archive management system for Qatar. Not intended for real-time data analysis, rather intended for off-line analysis of transportation supply, demand, and performance. The archive can be used to supply data for analysis of the existing transportation system as well as supplying data for modeling and simulating proposed transportation investments. The operational data stored should be multimodal and cover all aspects of operations.
Ashghal Backup TMC	Ashghal's backup Traffic Management Center, to be used in case of emergencies/crisis, major incidents, or major events.
Ashghal CCTV	Closed circuit television devices that are operated and maintained by Ashghal.
Ashghal CV Inspection Stations	Commercial vehicle inspection stations operated by Ashghal
Ashghal Detectors	Ashghal's detectors (e.g. loops, video detectors for vehicles, specialized detectors for pedestrians or bicycles).
Ashghal Environmental Sensors	Ashghal environmental, weather, roadway surface conditions sensors.
Ashghal HAR	Highway Advisory Radio. Traveler information broadcast over very low power commercial radio channels. Multiple broadcast frequencies can be used simultaneously to present the information in multiple languages. Associated signage would indicate to travelers that an important message is being broadcast, and may also indicate which languages are being broadcast on which frequencies.
Ashghal Infrastructure Security System	Security sensors and systems for Ashghal facilities
Ashghal Infrastructure Sensors	Sensors for measuring stress, vibration, weight, etc.
Ashghal Maintenance and Construction Vehicles	Ashghal maintenance and construction vehicles which might be used for roadway maintenance and construction activities
Ashghal Maintenance Operations Depots	Dispatches maintenance vehicles and equipment for road maintenance
Ashghal Other Maintenance and Construction Vehicles	Ashghal maintenance and construction vehicles which might be used for roadway maintenance and construction activities
Ashghal Other Traffic Signals	Field equipment including traffic signals, dynamic message signs, CCTV, and portable equipment owned by Ashghal that are connected to a field master rather than directly to the TMC.
Ashghal Over-height Vehicle Detection	Sensors that detect vehicles that are over the prescribed height for a given roadway. The sensors will activate when a vehicle is over-height, and activate both a warning sign and an in-vehicle warning.
Ashghal Over-height Warning Sign	Specialized warning sign that warns drivers if their vehicle is over-height
Ashghal Roadway Lighting Controller	Remotely controllable lighting.
Ashghal Roadway V2x System	Ashghal Roadway Vehicle Infrastructure Integration System. Dedicated short range communications is used to deliver real-time traveler information including travel times, incident information, road conditions, and emergency traveler information to vehicles as they pass VII roadside equipment along their route.
Ashghal Service Patrol Vehicles	Roadway service patrol vehicles operated by Ashghal
Ashghal Storage Facilities	The various maintenance facilities that Ashghal uses to store equipment and materials.
Ashghal Tag Detectors	Ashghal roadway tag detectors for the purpose of measuring anonymous travel time information
Ashghal Traffic Signals	Field equipment including traffic signals, dynamic message signs, CCTV, and portable equipment owned by Ashghal.
Ashghal V2x ISP	Information Service Provider for Ashghal Vehicle To Vehicle or Vehicle to Roadside Integration
Ashghal Workzone Safety Detectors	Detects incursions into workzone, generates alarms.
Border Inspection Administration	Border Inspection Administration
Border Inspection Systems	Represents systems at international borders
Bus Operator Control Center	Central bus operations center, including scheduling, vehicle tracking, and dispatch systems. Multiple operators may contract with Mowasalat to service routes.

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Commercial Buses	Private buses that shuttle passengers to/from hotels and other services or carry workers to work sites.
Commercial Driver ID Card	Commercial driver identification card that contains a reference to the drivers commercial vehicle drivers' license.
Commercial Parking Facilities	Commercial parking facilities open to the public such as at malls and hospitals.
Commercial Vehicle	Private commercial and fleet vehicles, not necessarily carrying ITS equipment, that are sensed by roadway ITS equipment for weight and/or license tag information.
Commercial Vehicle Administration	Permit systems, credentialing, etc. for commercial vehicles in Qatar
Commercial Vehicle Driver	Operators/drivers of commercial vehicles
CV Enforcement	The back office system for commercial vehicle enforcement.
DMS	Dynamic message signs.
Doha Water Bus	Fixed-route water public transportation vehicles that run in Doha Bay.
Doha Water Bus /Taxi Operations Control Center	Doha Water Taxi and Water Bus operations center, including dispatch, vehicle tracking, and scheduling.
Doha Water Bus/Taxi Customer Information Displays	Customer information display for Doha Water Busses and Taxis. Includes countdown clocks, in-station and in-vehicle displays.
Doha Water Taxi	Demand response water taxi service to run along Doha Bay.
Doha Water Taxi/Bus Security Equipment	Security monitoring, vehicle intrusion detection, emergency notification/alarm equipment, as examples
Driver	Drivers
Financial Institutions	Represents the financial institutions the parking, toll and public transportation agencies will use as part of electronic payment systems.
Freight Equipment	Commercial Vehicle Freight Equipment
Hospitals	Communicates with ambulances for hospital status for specific injuries. Includes specifically (but not limited to) Hamad Hospital.
Hukoomi e-Government Information Portal	Citizen and visitor information portal for Qatar government. A one stop shop for government services and information provided by the Qatari government.
ISF Lekhwiya Alerts and Advisories	Qatari Internal Security Force. Issues alerts and advisories.
ISF Lekhwiya Dispatch	Dispatch for Qatari Internal Security Force. Also coordinates with TMC for VVIP motorcades.
ISF Lekhwiya Police Vehicles	ISF Lekhwiya Police Vehicles.
Media	Print and Broadcast Media.
Milaha Freight Depot	Freight depot at Milaha port. Tracks shipments from ship to/from trucks.
MMUP Parking Management System	Privately operated parking lots owned by the Qatari Ministry of Municipality and Urban Planning (MMUP)
MMUP Traffic Data Collection Systems	Equipment owned and operated by MMUP that collects traffic data for planning purposes.
MOE Air Quality Sensors	MOE sensors to measure wide area pollution and point offender pollution.
MOE Emissions Management Center	Ministry of Environment's emissions management function. When air pollution exceeds thresholds, this element encourages changing the cost of parking and public transportation to encourage additional modal shift from vehicles to public transportation.
MOI Al Fazaa Police Patrol Dispatch	First responder police dispatch desk.
MOI Al Fazaa Police Vehicles	Al Fazaa Police Patrol Vehicles.
MOI Civil Defense Dispatch	Dispatch for Qatari Fire Brigade vehicles.
MOI Emergency 999 Call Center	Central call center for *SP and wireless 999 (Police, Civil Defence and Emergency) calls.
MOI Fire Brigade Vehicles	Fire and rescue emergency response vehicle of the MOI Fire Brigade
MOI NCC Emergency Operations Center	Emergency operation center for Qatar. Only operates during a crisis or major special event.

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MOI Traffic Police Commercial Vehicle Administration	Responsible for issuing Commercial Vehicle (CV) credentials using a future electronic process. Functions that might be covered could include: taking applications over the Internet for permits and special permits (e.g. over-height, overweight or hazardous materials) and issuing permits and route restrictions; issue safety status and compliance reports for vehicles and carriers.
MOI Traffic Police Dispatch	Dispatch for Traffic Police
MOI Traffic Police Signal Violation Detectors	Detectors designed to capture license plate images of vehicles that run red lights.
MOI Traffic Police Speed Detectors	Field equipment for monitoring vehicle speeds. May be used for automated speed enforcement.
MOI Traffic Police Speed Enforcement Authority	Authority responsible for speed enforcement in Qatar
MOI Traffic Police Traffic Operations Personnel	Personnel at MOI Traffic Operations Center
MOI Traffic Police Vehicles	MOI Traffic Police Vehicles
MOI Traffic Police Violation Customer Service Center	The MOI Violation Customer Service Center is responsible for validating traffic and speeding violations before posting them on the Hukoomi Customer Information Portal
MOI Vehicle Registration DB	Database for vehicle registration - used to associate a vehicle tag with an owner.
Mosque Parking Management	MoE owns parking lots at all mosques. These lots can be otherwise used for commuter parking.
Mowasalat Buses	Mowasalat public transportation vehicles
Mowasalat Customer Information Displays	Customer information displays for Mowasalat Bus. Includes countdown clocks, in-station and in-vehicle displays
Mowasalat Demand Response Vehicles	Paratransit vehicles
Mowasalat Feeder Vehicles	"Last Mile" feeder vehicles. Can be shuttles, minivans, golf carts, etc., all with the same fare payment equipment using the Qatar Fare Payment Instrument. Fares might be subsidized if the traveler connects before or after with fixed route bus or rail service. Objective is to increase ridership.
Mowasalat Parking Management System	Park and Ride parking operated by Mowasalat.
Mowasalat Public Transportation Maintenance Facility	Mowasalat maintenance facility for all public transportation vehicles.
Mowasalat Security Equipment	Security monitoring, vehicle intrusion detection, emergency notification/alarm equipment, as examples. Mowasalat Security Equipment connects to Lekhwiyah, Fire Brigade, and Traffic Police.
Mowasalat Taxi Customer Information Display	In-vehicle customer information display for Mowasalat Taxis. Capable of communicating a number of types of customer information, including vehicle location, cost, advertisements, and emergency messages.
Mowasalat Taxi Dispatch	Dispatch and operations centers for Mowasalat Taxis
Mowasalat Taxis	Mowasalat Taxi Vehicles
NDIA Freight Depot	Freight depot at NDIA airport. Tracks shipments from air freight to/from trucks.
NDIA Parking Management System	Parking and revenue management system for NDIA garages.
NDIA Terminal Operations Center	New Doha International Airport terminal information and communications hub. Has an interactive telephone system for traveler information. Manages shuttle bus demand at the terminal roadside by tolling for vehicle access and/or dwell time.
NDIA Terminal Toll Field Equipment	Field equipment that reads toll ID info from shuttle busses that have managed access at the terminal.
Operator Paratransit Dispatch	Provides dispatching functions for paratransit vehicles.
Other State TMC	TMC's located in Saudi Arabia and/or Bahrain (or the future causeway that will connect Qatar and Bahrain) that have or will have a land or causeway transportation border with Qatar. (Note that the Qatar-Bahrain Causeway/Friendship Bridge may have it's own TMC.)

ITS Element	Description
Parking Payment Customer Service Center	Parking Payment Customer Service Center for parking payment collection from traveler vehicle owners.
Private Auto Emergency Call Center	Can provide either concierge or emergency validation services. Vehicles can send their location and crash data after an incident, and staff at the call center can validate that an incident has occurred. After validation of a real incident requiring emergency response, the call center would notify the Qatar 9-9-9 call taking center for appropriate response. Concierge functions are not explicitly shown in this architecture.
Private Bus or Limo or VIP Fleet Operations Center	Private Bus or Limo or VIP Fleet Operations Center. Allows ISPs to make reservations for their services.
Private Car Rental Service Providers	Rental car operators. Functions include allowing multi-modal service providers to make reservations.
Private Commercial and Fleet Vehicles	This element represents the on-board ITS equipment associated with a commercial vehicle to include the transponder, vehicle, cargo, and trip monitoring systems.
Private Commercial Truck Parking	Truck parking lots outside of Doha so that deliveries can be staged for specified times. Developed by Ashghal but operated privately.
Private Fleet and Freight Dispatch	Private commercial fleet and freight dispatch.
Private Telecom Companies	Private telecommunications companies, such as Qtel or Vodafone.
Private Traveler Information Services	Private traveler information providers serving the region. This element could, in the future, provide support to the Qatar Transportation Information Portal since it collects information from a broad array of operating centers. Could also include websites of local media. May also include public transportation planning websites such as Google Transit.
Private Travelers Personal Computing Devices	Personal computing devices owned by private travelers, such as smartphones, tablets, etc.
Private Vehicles	Vehicles owned by private individuals in the area.
Private Weather Services	Private roadway/surface transportation weather information service.
Qatar Airways Cargo Operations Center	Qatar Airways Cargo Operations Center, will share schedule information with public transportation operators (for crew land transportation).
Qatar Airways Flight Operations Center	Qatar Airways Flight Operations Center. Shares flight information with public transportation operations centers.
Qatar Automated Fare Collection Center	Automated fare collection system for Qatar
Qatar Education City Parking Management	Parking management system at Qatar Education City
Qatar Government Transport Authority Finance Bureau	Unidentified (as yet) government bureau that provides subsidies to Mass Public Transport user accounts to support various goals and objectives (i.e. increase ridership). This is the government authority that will subsidize "first/last km" trips when the traveler makes a connection with a fixed-route public transportation mode. The government agency is still to be determined.
Qatar Meteorology Department	State of Qatar weather service for all users as well as civil aviation operations. The Meteorology Department operates 4 manned stations in (Doha, Alkor, Ruwais and Umsaeed), 9 Automatic Stations and one upper air Station at Doha International Airport.
Qatar SmartCard	Statewide SmartCard that can be used universally between any of the transportation providers (public and private) in the region including Mowasalat and QR services.
Qatar Smartcard Conductor Validator	The Conductor Validator is carried by the conductor and used to verify that travelers have a valid smartcard. The card data is read by the device. If the card is valid (has credit, the period is valid and has been validated in the vehicle or station), the device approves the card. If the card has no credit, the period is invalid or the card has not been validated, the respective reason will appear on the display of the device. In such an event the conductor may sell the passenger a ticket (like a vending machine) but perhaps with a large administrative fee, or the conductor may issue a "ticket" for the fare violation, or both (depending on Qatar policy).
Qatar SmartCard Vending Machines	Point-Of-Sale for Qatar Fare Cards. Fare cards will be interchangeable between Doha Metro, Mowasalat Buses, WBAPM, and Water Taxi.
Qatar Transportation Data Archive Users	Users of the Qatar archive management system.

<i>ITS Element</i>	<i>Description</i>
Qatar Transportation Information Portal	Transportation information portal for Qatar. A one stop shop for transportation information provided by the Qatari government.
Qatar University Parking Management	Parking management system at Qatar University
QR Customer Information Display	Information display for Qatar Railways. Includes countdown clocks, in-station and in-vehicle information displays
QR Lusail LRT Customer Information Display	Information display for Qatar Railways Light Rail Transport. Includes countdown clocks, in-station and in-vehicle information displays
QR Lusail LRT Maintenance Facility	Lusail LRT maintenance facility for light rail
QR Lusail LRT Operations Center	Qatar Railways Light Rail Transport rail control center and operations hub.
QR Lusail LRT Security Equipment	Security monitoring, vehicle intrusion detection, emergency notification/alarm equipment, as examples.
QR Lusail LRT Vehicles	Qatar Railways Lusail Light Rail Transport Vehicles
QR Lusail LRT Wayside Equipment	Wayside equipment that supports ITS services at at-grade (level) crossings: vehicle blockage detection, train detection, initiation of both train and roadway vehicle signaling and communication of intersection status to Rail Operations and the TMC.
QR Maintenance Facility	Qatar Railways maintenance facility for all rail transport vehicles.
QR Metro Customer Information Display	Customer information display for Doha Metro. Includes countdown clocks and information displays both in stations and in vehicles
QR Metro Rail Maintenance Facility	Doha Metro Rail maintenance facility for all rail vehicles.
QR Metro Rail Operations Control Center	Doha Metro rail control center and operations hub
QR Metro Security Equipment	Security monitoring, vehicle intrusion detection, emergency notification/alarm equipment, as examples
QR Metro Vehicles	Doha Metro public transport vehicles
QR Parking Management	Parking management for Qatar Railways high speed rail
QR Passenger Rail Vehicles	High Speed Passenger Rail Vehicles
QR Rail Operations Center	Operations centers for Qatar Railways
QR Security Equipment	Security monitoring, vehicle intrusion detection, emergency notification/alarm equipment, as examples.
QR WBLRT Control Center	West Bay LRT Control Center, including LRT dispatch
QR WBLRT Customer Information Display	Customer information display for West Bay LRT. Includes countdown clocks, in-station displays and in-vehicle displays
QR WBLRT Rail Maintenance Facility	WBLRT maintenance facility for rail vehicles.
QR WBLRT Security Equipment	Security monitoring, vehicle intrusion detection, emergency notification/alarm equipment, as examples.
QR WBLRT Vehicles	West Bay LRT Vehicles
QR WBLRT Wayside Equipment	Wayside equipment that supports ITS services at at-grade (level) crossings: vehicle blockage detection, train detection, initiation of both train and roadway vehicle signaling and communication of intersection status to Rail Operations and the TMC.
Regional Event Promoters	Event promoters within the region that not only plan regional events but whom provide information about upcoming events to agencies for the remediation of traffic and incidents that could affect the region.
Regional TMC	Public or privately operated regional TMCs
Roadway Short Range Traveler Information Communications	Roadway equipment capable of transmitting short range traveler information for the purposes of in-vehicle signage
SCH HMC Ambulance Service Control Center	MOI operated control center for Hamad Hospital. Includes Flying Bird and Ambulance dispatch
SCH HMC Ambulances	Ambulances for Hamad Hospital
SCH HMC Flying Bird Helicopter	Hamad Hospital ambulance helicopter.

<i>ITS Element</i>	<i>Description</i>
Third Party Logistics Providers	Private Brokers and Freight Forwarders that engage in the shipment of freight by multiple means (e.g. ship and air), in addition to road-going trucks.
Traffic Management Center	Traffic Management Center for Qatar. Controls Dynamic Message Signs (DMS), Closed Circuit Television (CCTV) cameras, signal control systems, lane control signals, variable speed limits, Over-height Vehicle Detection Systems (OVDS), Weigh in Motion (WIM), tunnel systems, detectors, Automatic Vehicle Location (AVL), License Plate Recognition (LPR), and serves as the dispatch center for maintenance vehicles
Vehicle Characteristics	This terminator represents the external view of an individual vehicle. It includes vehicle characteristics such as height, width, length, weight, and other properties (e.g., magnetic properties, number of axles) that allow an individual vehicle to be detected and measured or classified.
Vehicle Short Range Traveler Information Reception	In-vehicle equipment capable of receiving short range wireless communications from roadway equipment for the purpose of traveler information. The received information can be either enunciated or presented as text to the traveler in their language of choice, or presented in some other symbolic or audible form designed to minimize driver distraction.