

NAFITH-OMAN PROJECT

May 2020

Overview

Nafith International (“Nafith”) designs, builds, and operates cutting-edge intelligent transportation systems to improve freight transportation, with a focus on integrating and synchronizing truck transport with operating activities at port terminals, free-trade zones, and similar facilities. Nafith began operating in Jordan over a decade ago and in Iraq during 2016.

The country of Oman, as part of its decades-long effort to diversify its petroleum-based economy, has established a network of industrial estates to promote economic development, with a focus on manufacturing. These have been developed by a publicly owned entity, The Public Establishment for Industrial Estates -- Madayn (“Madayn”). Madayn was established in 1993, and currently manages and operates nine zones (“Estates”)¹ across the country. (www.madayn.om)

Since 2016 Nafith and Madayn have been discussing how Nafith could install at the Madayn Estates a state-of-the-art system to monitor, control, and streamline the entry and movement of trucks into the Estates. This would be based on the systems Nafith operates in Iraq and Jordan. Based on an understanding of Madayn’s requirements, extensive discussions with Madayn, and multiple site visits to the various Estates, Nafith and Madayn agreed in September 2019 to a solution for Nafith to build and operate an access management system for all of Madayn’s current and future Estates. The system initially will focus on truck access and over time will incorporate passenger vehicles.

The solution follows the build-operate-transfer (BOT) concession agreement model. Nafith has established a project company in Oman (“Nafith-Oman”) that has entered into a concession agreement with Madayn. Under that agreement:

- Nafith-Oman will be responsible for building and operating a system to control vehicle access² to each Estate (the “System”) based on phased roll-out schedule. At each Estate, Nafith-Oman will operate a set of mandatory services.
- Madayn will issue binding regulations requiring every truck pay directly to Nafith-Oman a pre-set fee for each mandatory Nafith service. Madayn will receive a revenue share.
- Nafith-Oman will be jointly owned by Nafith and Shumookh Investment and Services (“Shumookh”), a parastatal company owned by the Omani government.

The investment plan calls for spending US\$17 million during the first three years, and double that over the lifetime of the agreement. The project is projected to create 135 jobs.

¹ Seven industrial cities in Sur, Suhar, Raysut, Nizwa, Buraimi, Rusayl, Samail, along with the Knowledge Oasis Muscat (KOM) and the Al Mazunah Free Zone.

² Nafith and Madayn have also discussed controlling the access of people at the Estates. That is not part of the business plan at this time, but could be an added service.

System Design

The system combines automated access control at each Estate, with the design tailored to the specific needs and configuration of that Estate, a truck weighing system at each Estate, with the Nafith suite of software systems. The System will be operated from a centralized Command and Control Center (“CCC”). This solution utilizes approaches and proprietary technology developed by Nafith that are deployed in Iraq and Jordan.

The system consists of three elements:

1. **Redesigned Truck Flows.** A series of re-engineered processes (i.e., work flows) for trucks within the Estates.
2. **Technology Platform.** An information technology application that organizes and controls the movements of all trucks controlled by the System. This includes a truck identification system to control access and provide near real-time tracking as trucks traverse the Estates. Users will access the System via Apps and the Internet.
3. **Physical Infrastructure.** At each Estate, a customized configuration of iGates and associated infrastructure will be installed to control truck traffic.

Redesigned Truck Flows

A new work flow design will manage the entry of trucks into each Estate and control their movements until they exit. This redesigned System is based on extensive data gathering, process mapping, and process redesign activities conducted by the project team. The redesigned System focuses on smoothing the flow of trucks through the Estates, and creating control points to ensure that bottlenecks do not occur and that sufficient trucks are available when needed to maximize Estate productivity.

Under the new System, for a truck to enter an Estate it needs to obtain a Nafith-Oman permit. In addition to providing access, the permit contains instructions that govern the truck’s movements and activities while it is under the jurisdiction of the System. The fee charged for each permit also is Nafith-Oman’s principal revenue source.

Technology Platform

Overall control is maintained by the use of the proprietary **NFlow** System, which was developed for the project in Aqaba, Jordan, and is used by Nafith-Iraq. NFlow (**Nafith Freight Logistics Operational Workflow**) is a capacity management work flow-based system, is used online, and provides real-time interaction with users. NFlow integrates with multiple stakeholders, including facilities in the Estates, transport authorities, trucking companies, and other involved parties. NFlow combines data verification, capacity management, vehicle routing algorithms, and location monitoring.

Nafith's **Registrar** System utilizes RFID³ technology to identify, manage, and control vehicles entering the Estates. Nafith-Oman RFID tags will be affixed to truck windshields. The tags are integrated the Registrar database of trucks, drivers, employees, companies, and other involved parties.

The Nafith RFID tags are inexpensive, can be read at a range of up to 8 meters, are tamper-proof (they break upon removal), and are secure. The tags were designed to operate in hot and harsh conditions. Nafith has installed over 20,000 RFID Tags.

Physical Infrastructure

The development team has surveyed each Estate, and based on its configuration, traffic volumes, growth, and other considerations will install a set of Nafith proprietary iGates and Portals at each Estate. The iGates and Portals monitor and optimize vehicle flow and movement, increase security, and reduce truck waiting times.

Intelligent Gates (iGates): Nafith developed and has installed proprietary iGates at its projects in Iraq and Jordan. As the name implies, iGates control access to the facility to be secured, as part of an integrated, IT-based system.

The iGates were designed to have no human staff of the ground, and instead rely on an eKiosk system that checks the vehicle information, utilizing the RFID tag, cameras, and other sensors. Communication links (cameras, a terminal screen, and phone) connect the driver with a centralized Command and Control Center⁴. Access is controlled by road barriers (gates) and traffic lights. These iGates were configured for hot and harsh environmental conditions. Currently over 3,000 trucks per day are passing through the Company's iGates in Iraq and Jordan.

Portals utilize RFID readers and advanced cameras to record passing trucks while the trucks are moving. This allows for the efficient tracking of trucks from the time they enter an Estate until it exits, allowing for closed-loop tracking, comprehensive auditing, and the creation of robust data to improve operations.

Weighbridges: Madayn requires that each truck be weighed before it leaves an Estate. This is a cumbersome process, where delays and back-ups are endemic, and is susceptible to corruption. As part of the plan, Nafith-Oman will install the **NCheck** (weighing station) system at each industrial Estate. NCheck combines one of many weighbridges (i.e., a truck scale) with the RFID technology in the **Registrar** system and applies a suite of algorithms to identify and deter fraudulent activity.

³ Radio frequency identification (RFID) systems identify an object using radio waves. An RFID system consists of three basic components: i) a tag containing unique information encoded on an integrated circuit, ii) a stationary antenna that emits radio signals to activate the tag and read and write data to it, which is coupled with iii) a reader that decodes the data encoded in the tag. This data is then passed to the operating system.

⁴ This was seen as a way to cut the pervasive petty corruption that accompanied nearly every human interaction at Umm Qasr port in Iraq when the Nafith team arrived to design that system.

If the algorithms detect anomalies or potential fraud at the weighbridge, the appropriate authorities are contacted. Of equal value, the weight and other pertinent information is written to the RFID tag in a secure and tamper-proof way, which can be read at other weigh stations across Oman, essentially creating a network of weighbridges to increase compliance with truck weight limitations and to minimize smuggling tampering with cargo.

Principal Benefits

By redesigning and managing the process for trucks to pick up or drop off goods at the IEs, the project is providing significant benefits to Oman's trade and transport sectors, the government, and the nation.

These benefits derive largely from three key features of the project:

- **Control and streamline truck access to the IEs.** System implementation will reduce truck waiting times, increase truck and trucker productivity, decrease trucking costs, and lower emissions, fuel consumption and accidents.
- **Increase compliance with transport and trade regulations.** Improve information quality and integrate information from multiple data sources.
- **Magnify visibility and create transparency.** The System ensures that all trucks follow documented procedures that are managed and tracked by the System, a foundation for security.

Company Background

Nafith was founded by NTELX, a U.S.-based technology company, and the company's Jordanian partners, Sameer Mubarak and Nourah Mehyar. Initial support was provided by the U.S. Trade and Development Agency in 2006. In 2015 Nafith received an equity investment from the IFC, the World Bank's private-sector investment arm, and Foursan Capital Partners, to support its expansion into Iraq, and subsequently to other countries in the Middle East and elsewhere.

Nafith's foundation is a breakthrough system developed to manage truck movements to and from the historic port of Aqaba, Jordan's sole seaport. The Aqaba Truck Control System eliminated the chaos, congestion, and delays that plagued truck transport at Aqaba. In 2009 the Aqaba system received the annual award from the Intelligent Transportation Society of America for the best innovative service for improving transportation operations.

Nafith started operating a similar system during 2016 at Umm Qasr, Iraq's principal seaport. Nafith designed and deployed an integrated information technology platform for system users (principally the port operators and truck dispatchers); built staffed and automated checkpoints that deployed Nafith's proprietary intelligent gates; placed over 10,000 tracking tags on trucks that serve the port, to expedite and provide secure entry and transit through the port; constructed a truck marshalling yard; and redesigned operating processes within the port. In 2017 the project received a special commendation from the [Financial Times](#) (London) for transformational infrastructure impacting the developing world.