Challenges of Emergency Response System Implementation in Kurdistan

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Introduction

1. The Ministry of Health in Kurdistan has recently implemented their first CAD System (Computer-Aided Dispatch).

2. This paper describes the challenges that were faced to be able to launch this system, and how they were overcome.

Outline

About Kurdistan

1. Kurdistan "Land of the Kurds" is the Northern part of Iraq
2. It operates under an independent Kurdistan Regional Government (KRG)
3. KRG consists of 3 main Governorates: Erbil, Sulaimaniya, Duhok
4. Official Languages are Kurdish and Arabic

Erbil Governorate

1. Erbil City is the capital of Erbil Governorate

2. It is also the capital of KRG and the main business center

3. The image shows Erbil city with the central Erbil citadel which houses the "old city"

Source: Wikipedia

Duhok Governorate

Source: Wikipedia

Sulamaniya Governorate

Source: Wikipedia

The Ministry of Health

Ministry of Health (MOH)

Erbil Directorate of Health (DOH)

Duhok Directorate of Health (DOH)

Sulaimaniya Directorate of Health (DOH)

Each Directorate operates under its own procedures.

The Legacy Emergency System
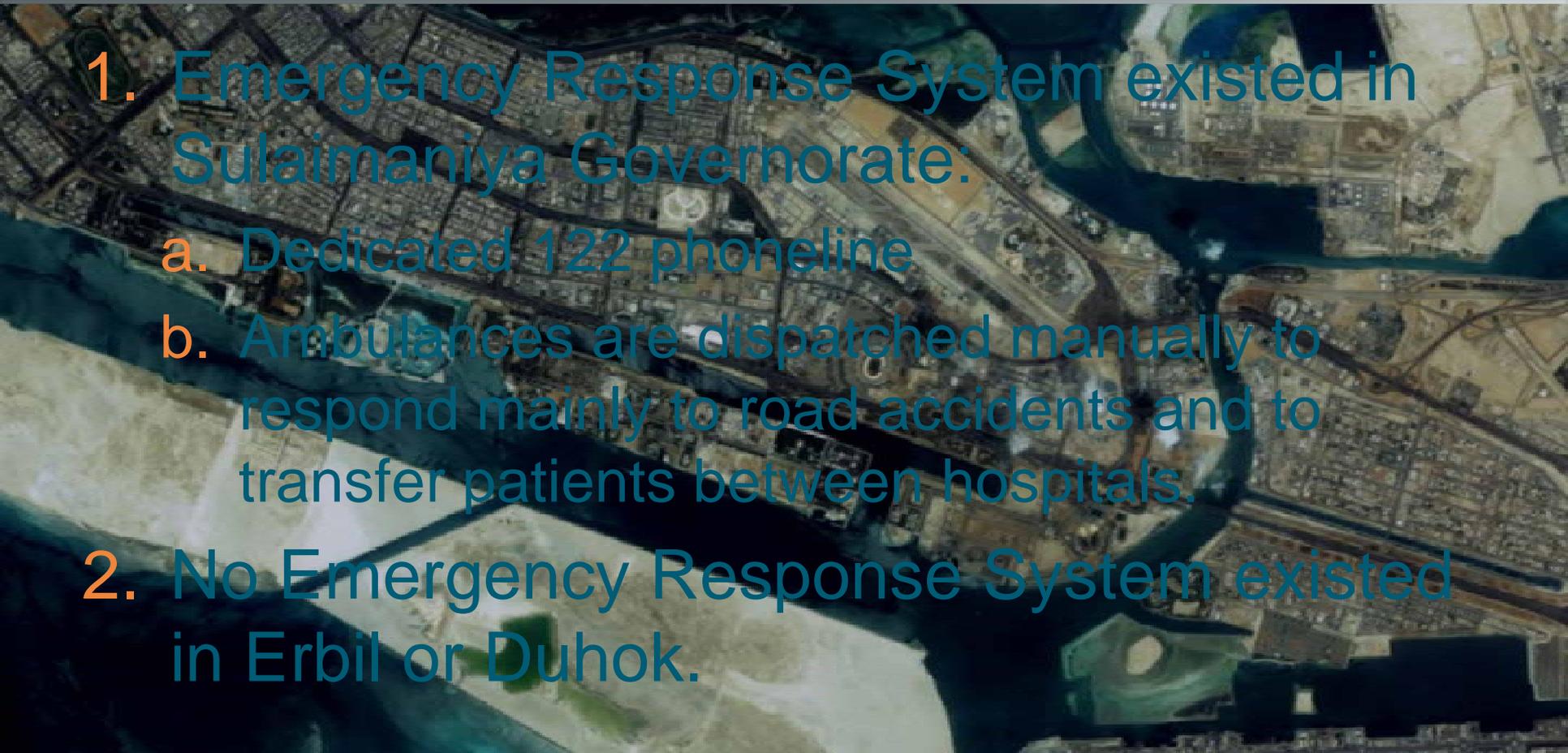
1. Emergency Response System existed in Sulaimaniya Governorate:
   a. Dedicated 122 phoneline
   b. Ambulances are dispatched manually to respond mainly to road accidents and to transfer patients between hospitals.

2. No Emergency Response System existed in Erbil or Duhok.

The Implemented Project

1. The project was funded by a grant.
2. It was an ambitious undertaking in less than 2 years, involving multiple parties.
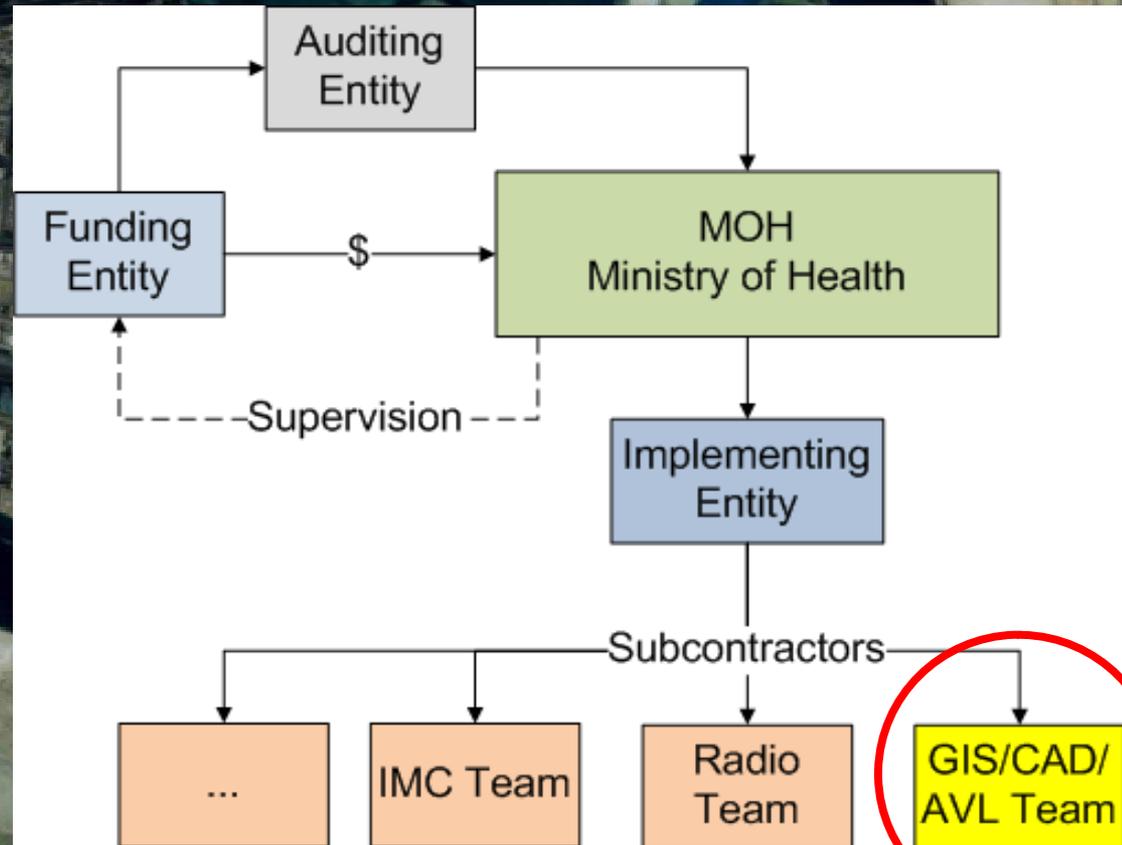
Project Components

1. The project components were:
   a. Building 3 ECC's (Emergency Coordination Centers), one in each Governorate
   b. Establishing a radio communication system for communication between the ECC's and the ambulances
   c. Establishing a common 122 emergency phone line across Kurdistan
   d. Staffing the ECC's and providing medical training
   e. Establishing the GIS CAD/AVL system…

GIS CAD/AVL System Components

1. Installing GPS devices in 112 ambulances for tracking the locations of the ambulances
2. Equipping the ECC's with the servers and workstations required to run the dispatch software (3 dispatcher seats per shift per ECC)
3. Installing and configuring the CAD/AVL software
4. Acquiring and integrating map data from government entities in KRG
5. Training the ECC staff on using the CAD/AVL software and on handling emergency situations.

GIS Success Components

1. As any GIS system, the success of the CAD/AVL system relied on the successful integration of the following components:

   a. Data
   b. Software
   c. Hardware
   d. People
   e. Procedures & Analysis
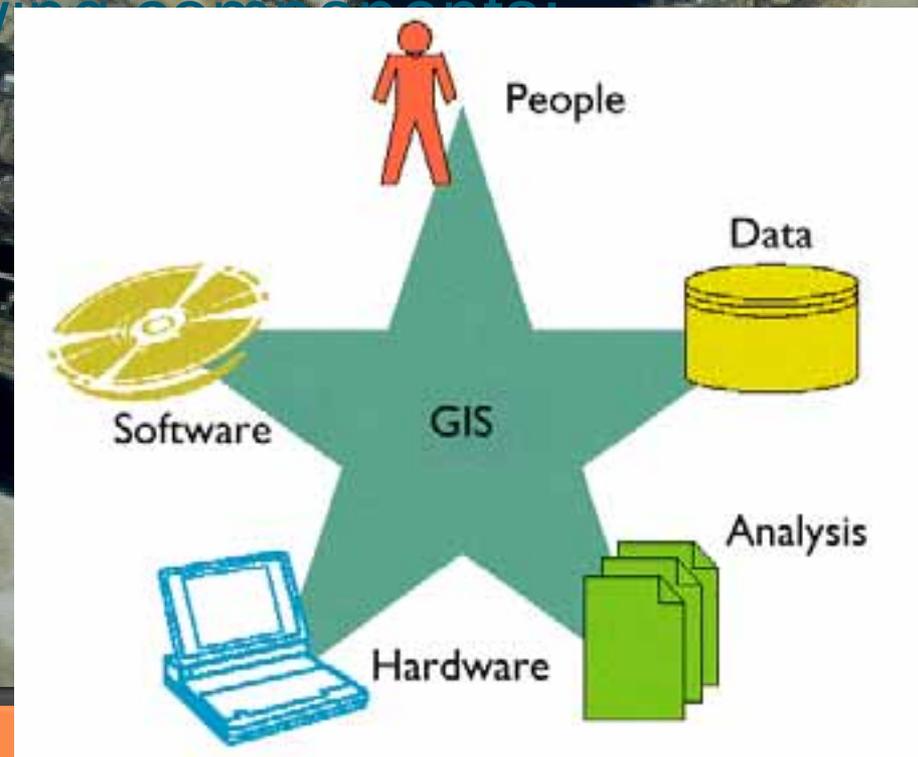
Challenge 1: Data

1. The Need:
   a. Reliable and up-to-date map data
2. The Challenge:
   a. No single official source of maps exists
   b. Several government entities have data but are reluctant to share it
   c. The existing data is not being updated

Challenge 1: Data

1. The Resolution:
   a. Data was collected from the different government sources with the influence of the Minister of Health and consolidated into one map for all the 3 governorates
   b. In cases of duplicate data, the more recent and more comprehensive set of data was retained
   c. …

Challenge 2: Data

c. Procedure for continuous data update by the ECC employees was set (but not
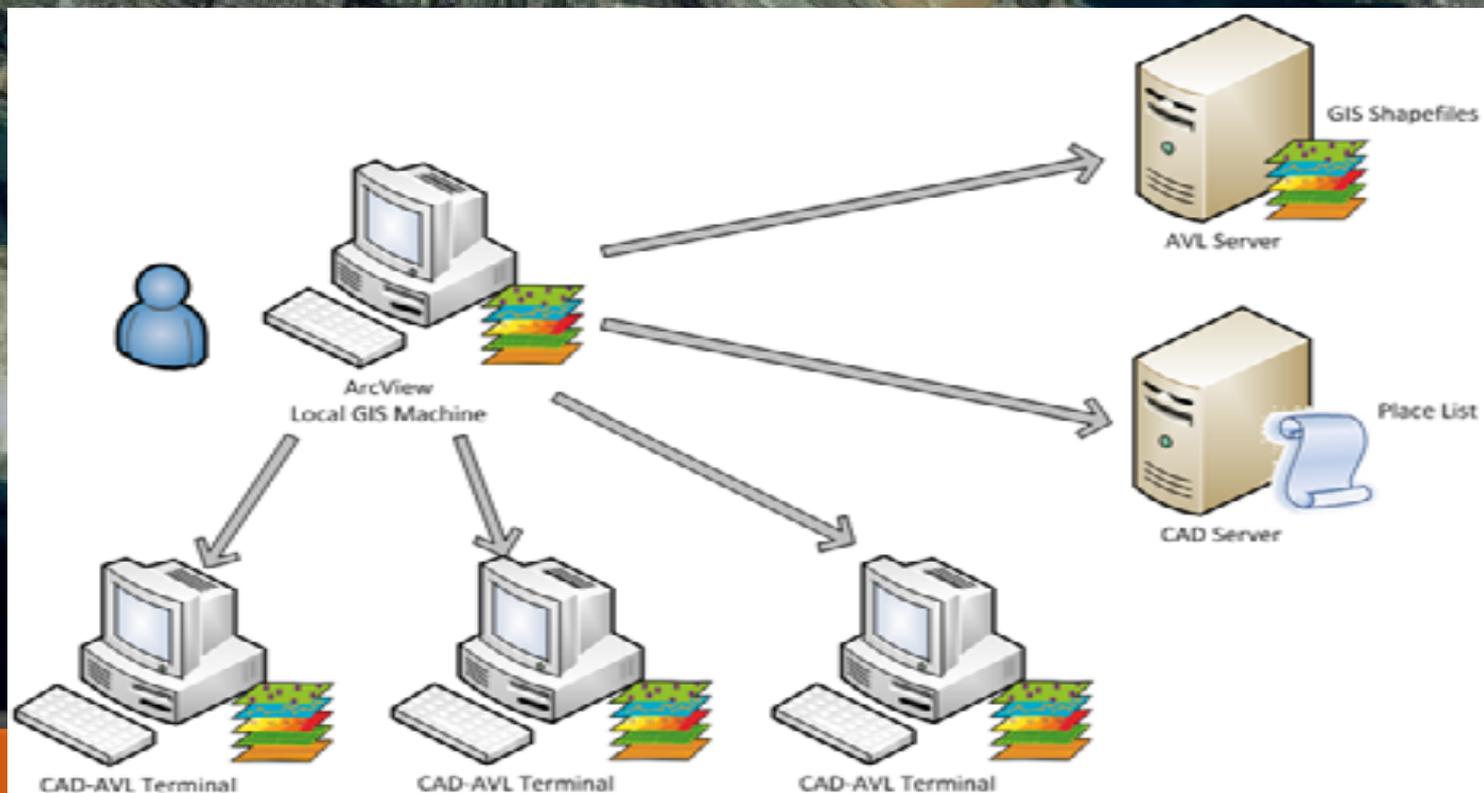
Challenge 2: Data

1. The Need:
   a. Navigable Road Network for the CAD/AVL user to determine the nearest ambulance to an incident and determine the shortest path
2. The Challenge:
   a. Navigable network might exist for some Duhok cities by commercial companies, but no comprehensive network is available for use.

Challenge 2: Data

1. The Resolution:
   a. Standard street maps were used instead, with the nearest ambulance determined by straight-line distance
   b. CAD software is ready to be configured with navigable road network, should it become available in the future
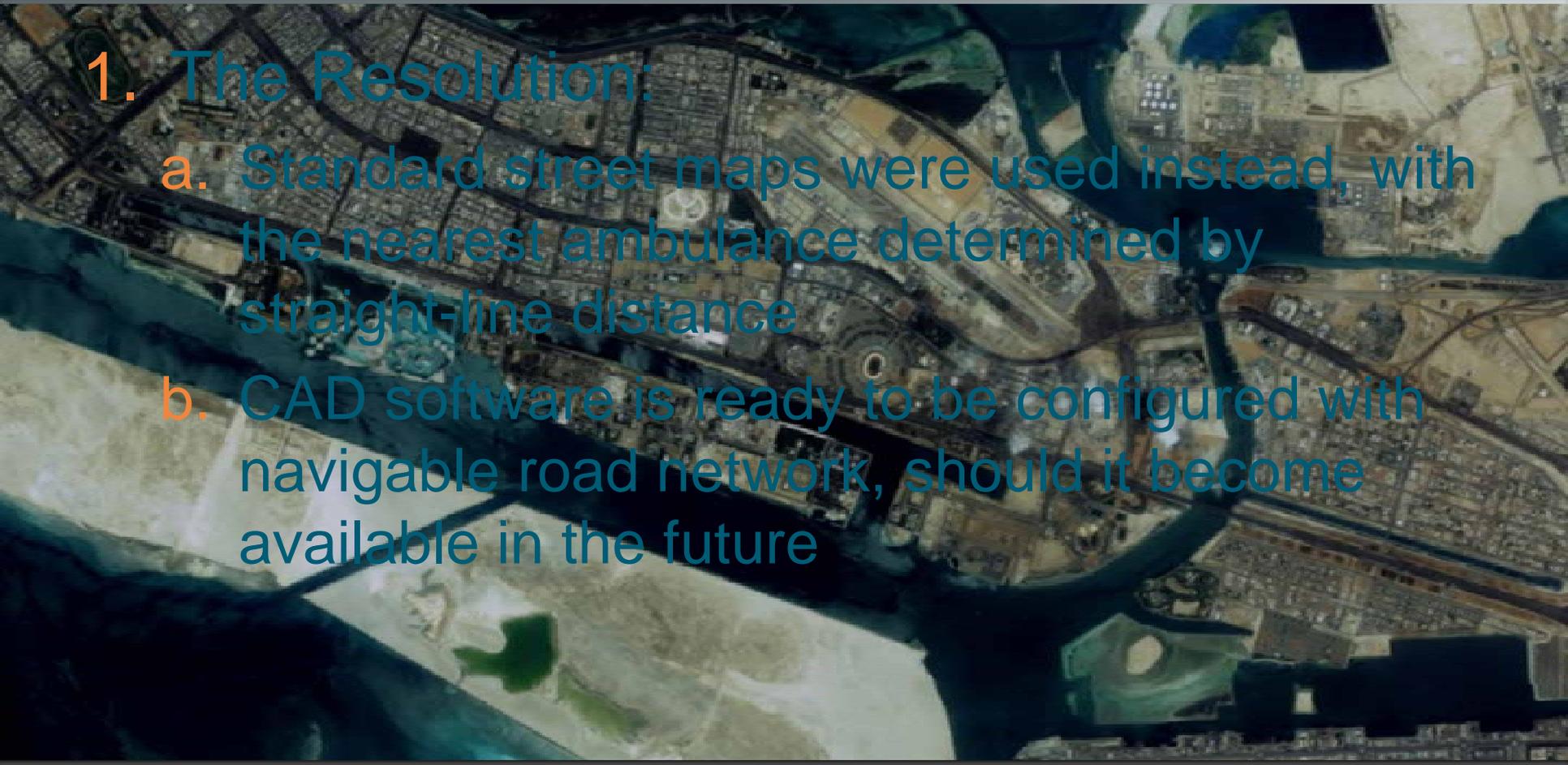
Challenge 3: Data

1. The Need:
   a. Proper Addressing System to be able to record the locations of incidents provided by the citizens dialing the 122 number

2. The Challenge:
   a. In Kurdistan, there are attempts to have a formal and unified addressing system for all KRG, but no such system is available to-date

Challenge 3: Data

1. The Resolution:
   a. The system was configured to mimic real-life where addresses are given based on a certain known landmark.
   b. Addresses were based on nearest Landmarks and Sub-district names inside cities, and based on Landmarks and Village names outside cities (Example: near Mateen Bank in Semel), with the ability to add a text description of the location.

Challenge 4: Software, Hardware and Communications

1. The Need:
   a. State-of-the-art technology was required to run the system efficiently and to handle the capacity of calls and data to be stored

2. The Challenge:
   a. High-end servers and equipment are not available in the local market
   b. Strict customs procedures do not allow the importing of goods without authorization

Challenge 4: Software, Hardware and Communications

1. The Resolution:
   a. The equipment was ordered at an early time to allow for customs delays
   b. The Ministry of Health issued the legal clearance papers to allow for importing the equipment
   c. Specialists from USA and Lebanon performed the installation and setup and knowledge handover to appointed FCC Administrators

Challenge 5: Software, Hardware and Communications

1. The Need:
   a. AVL requires stable high-speed Internet connection at the ECC's to receive AVL messages from the ambulances (sent by GSM/GPRS connection)

2. The Challenge:
   a. It was very difficult to achieve a stable Internet connection. Internet experiences frequent cuts and slowness, disrupting the AVL display for the dispatchers
   b. GSM/GPRS coverage is not uniform. Rural and mountainous areas have poor GSM coverage.

Challenge 5: Software, Hardware and Communications

1. The Resolution:
   a. The CAD/AVL system was configured to operate in full offline mode when needed. All incoming incidents can be recorded but only ambulance visibility is temporarily disrupted.
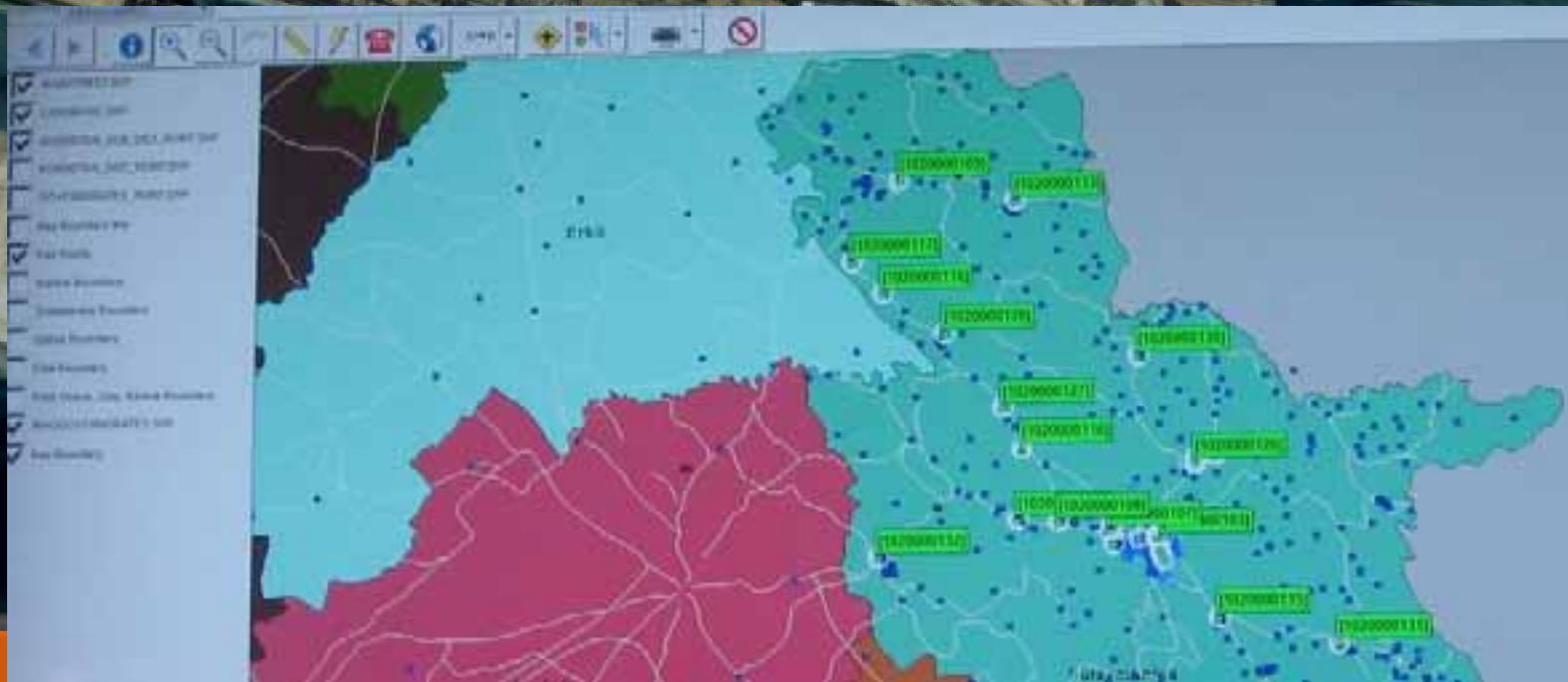
Challenge 6: People

1. The Need:
   a. Skilled employees trained on emergency procedures and on the CAD/AVL software to operate the ECC's and handle emergency calls
2. The Challenge:
   a. The Ministry of Health staff had very poor computer skills
   b. Most users spoke only Kurdish. Some spoke Kurdish and Arabic. Very few knew English.
   c. The trainers spoke mainly English and also Arabic

Challenge 6: People

1. The Resolution:
   a. More time was allocated to training than usually required to learn the CAD/AVL software
   b. Translators were brought in to translate from English to Kurdish or Arabic to Kurdish.
   c. Trainers focused on empowering one or two skilled users with all the knowledge, and appointing them to assist the other users in daily operations.

Challenge 6: People
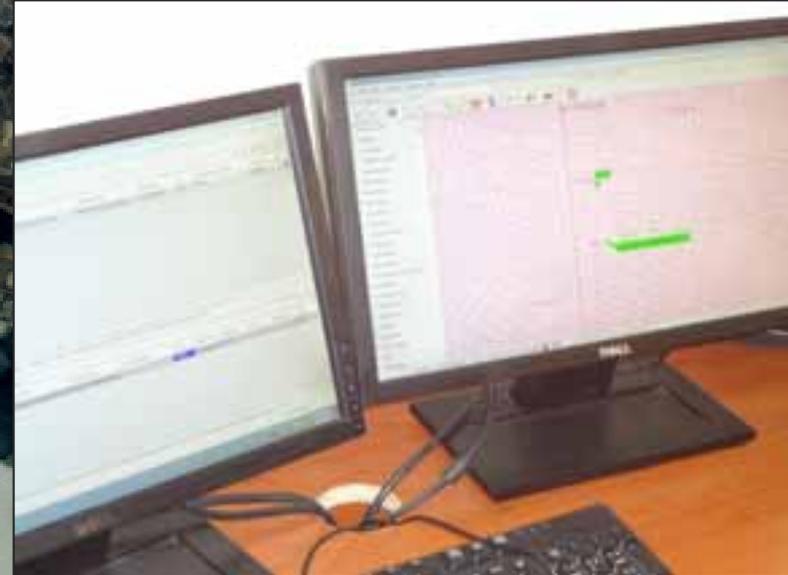
Challenge 7: People

1. The Need:
   a. Citizen awareness of the 122 emergency centers and the services they offer

2. The Challenges:
   a. In Sulaimaniya, people had little confidence in the legacy system and resorted to driving the injured to the hospital themselves.
   b. With the establishment of the ECC's, people needed to know that they can rely on it.

Challenge 7: People

1. The Resolution:
   a. The system was soft-launched in order to test it thoroughly and address issues before exposure to the general public
   b. Media campaigns were launched to familiarize the public with the new service

Challenge 8: Procedures & Analysis

1. The Need:
   a. The 3 Governorates needed a unified set of processes and procedures to follow.

2. The Challenge:
   a. The Ministry of Health did not have an established set of procedures for emergency handling

Challenge 8: Procedures & Analysis

1. The Resolution:
   a. The Ministry was advised to form committees to write a formal set of procedures, and to put a methodology for updating the procedures, with advice from international experts.
   b. People were trained on the new procedures and are implementing them.

Event Code	Description	Event Code	Description
Abdominal	Abdominal Pain	Explosion	Explosion
Airway	Airway Obstruction	Faint	Fainting/Syncope
Allergic	Allergic reaction	Fall	Fall
Altered	Altered mental status	Fever	Fever
Back Pain	Back Pain	Fire	Fire/Flame Injury
Behavior	Behavior/Psych	Gun	Gun shot
Bike	Bike/Motorcycle	Headache	Headache
Bite	Bite/Sting Injury	Hypertension	Hypertension
Bloody Stool	Bloody Stool	Hypothermia	Hypothermia
Breathing	Breathing Issues	Inhalation	Inhalation Injury

Post-Launch

1. Cut-Live was in February 2012
2. The system has been running well, with some technical issues that are being resolved (such as Internet cuts, phone line problems…)
3. The system was a good step towards a centralized and formalized Emergency Response System. It needs continuous monitoring, and there is much room for improvement.

Statistics

1. Erbil

Call Distribution per month								
Month	Received	Answered	Unanswered	Transfers	% Answ	% Unansw	Avg Durat.	Avg Wait
2012-01	13134	4488	8646		34.17 %	65.83 %	0:33 min	34 secs
2012-02	90127	12342	77785		13.69 %	86.31 %	0:16 min	15 secs
2012-03	34734	14608	20126		42.06 %	57.94 %	0:14 min	32 secs

2. Duhok

Month	Received	Answered	Unanswered	Transfers	% Answ	% Unansw	Avg Durat.	Avg Wait
2012-01	5604	697	4907		12.44 %	87.56 %	0:22 min	33 secs
2012-02	14099	1236	12863		8.77 %	91.23 %	0:24 min	21 secs
2012-03	10046	1186	8860		11.81 %	88.19 %	0:18 min	21 secs

3. Suli

Month	Received	Answered	Unanswered	Transfers	% Answ	% Unansw	Avg Durat.	Avg Wait
2012-01	227	227			100.00 %	0.00 %	0:05 min	1,778 secs
2012-02	25696	21109	4587		82.15 %	17.85 %	0:24 min	6 secs
2012-03	27829	25683	2146		92.29 %	7.71 %	0:19 min	7 secs

Thank You!