Geographic Information System (GIS) in Big Data Analytics: A Case Study of Potable Water Sector in Egypt .

Connecting Gears

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Holding Company for Water & Waste water, Egypt
Planning & Design Sector (GIS Department)

Agenda

Connecting Gears

- About us
- GIS for Water Industry
- Challenges
- Vision
- Solution
- Roadmap

HCWW currently manages 28 subsidiaries

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Connecting Gears

Challenges …

Allocating the major portion of the investment in urban infrastructure utilized for water distribution , and **maintaining** the assets with **best network optimization**.

Aging Assets

Planning for maintenance & replacement

Infrastructure cost Investments

Deciding new projects location and investment areas to optimize distribution

Challenges …

Effectively designing water distribution systems to deliver potable water over **spatially extensive areas** in required quantities and under satisfactory pressures.

Effective network design

Assuring optimum network path

Workforce Managing

Start building your knowledge base

Challenges …

Cost-effectiveness & reliability in system design are also important.

Decision support

Where to build new reservoirs?

Cost Containment

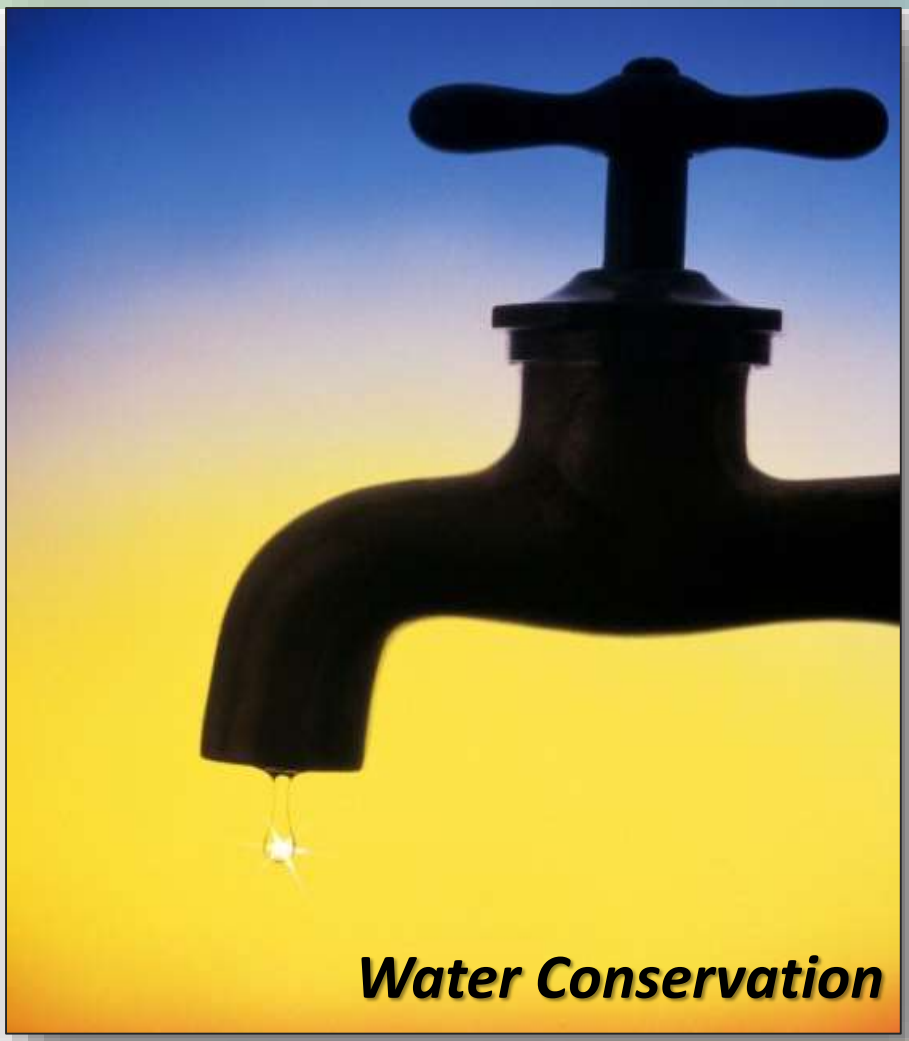
Need to minimize operations cost

Challenges …

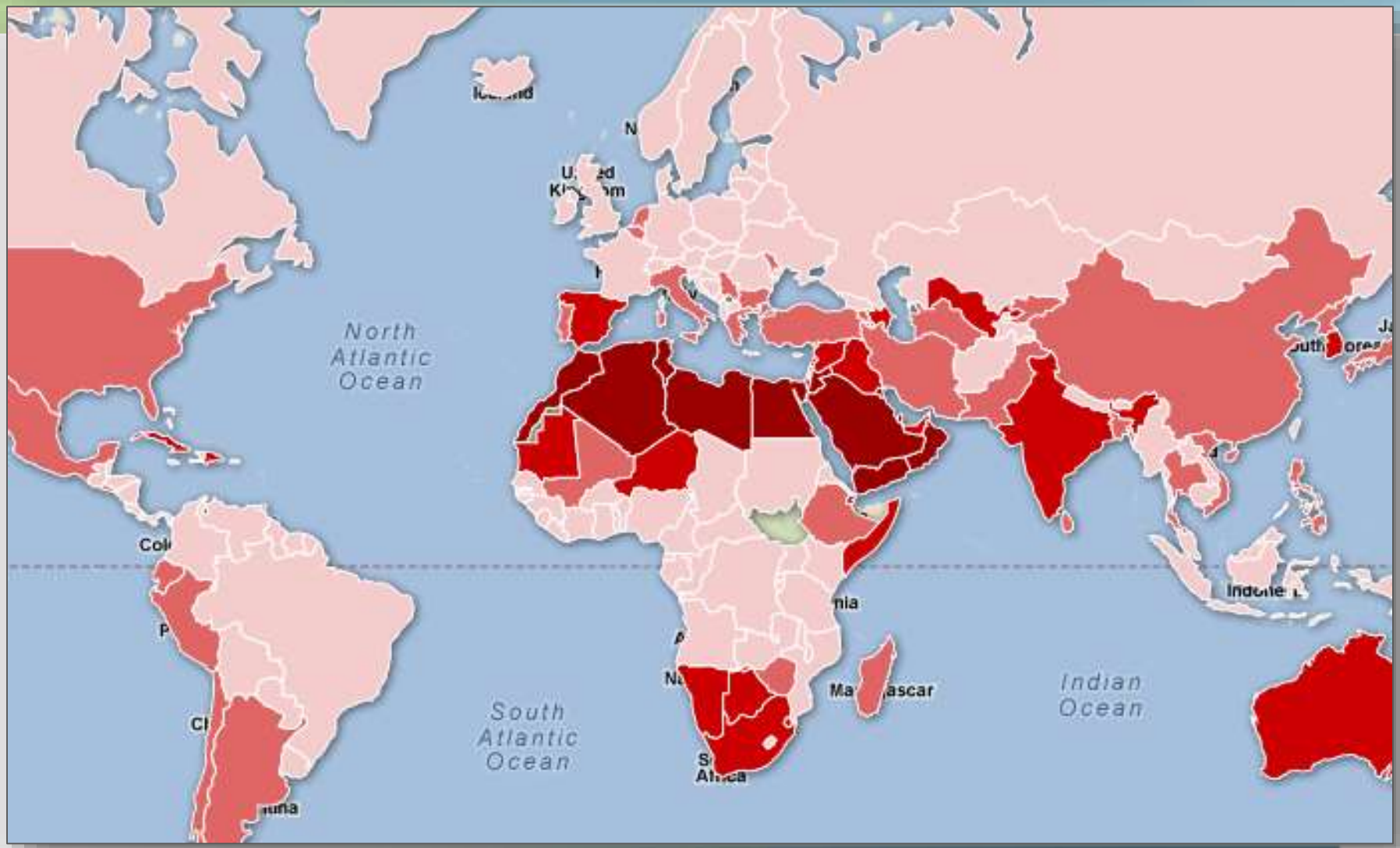
Public awareness & communication

Need better communication channels

Challenges …



Worldwide Water Stress



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- **Vision**
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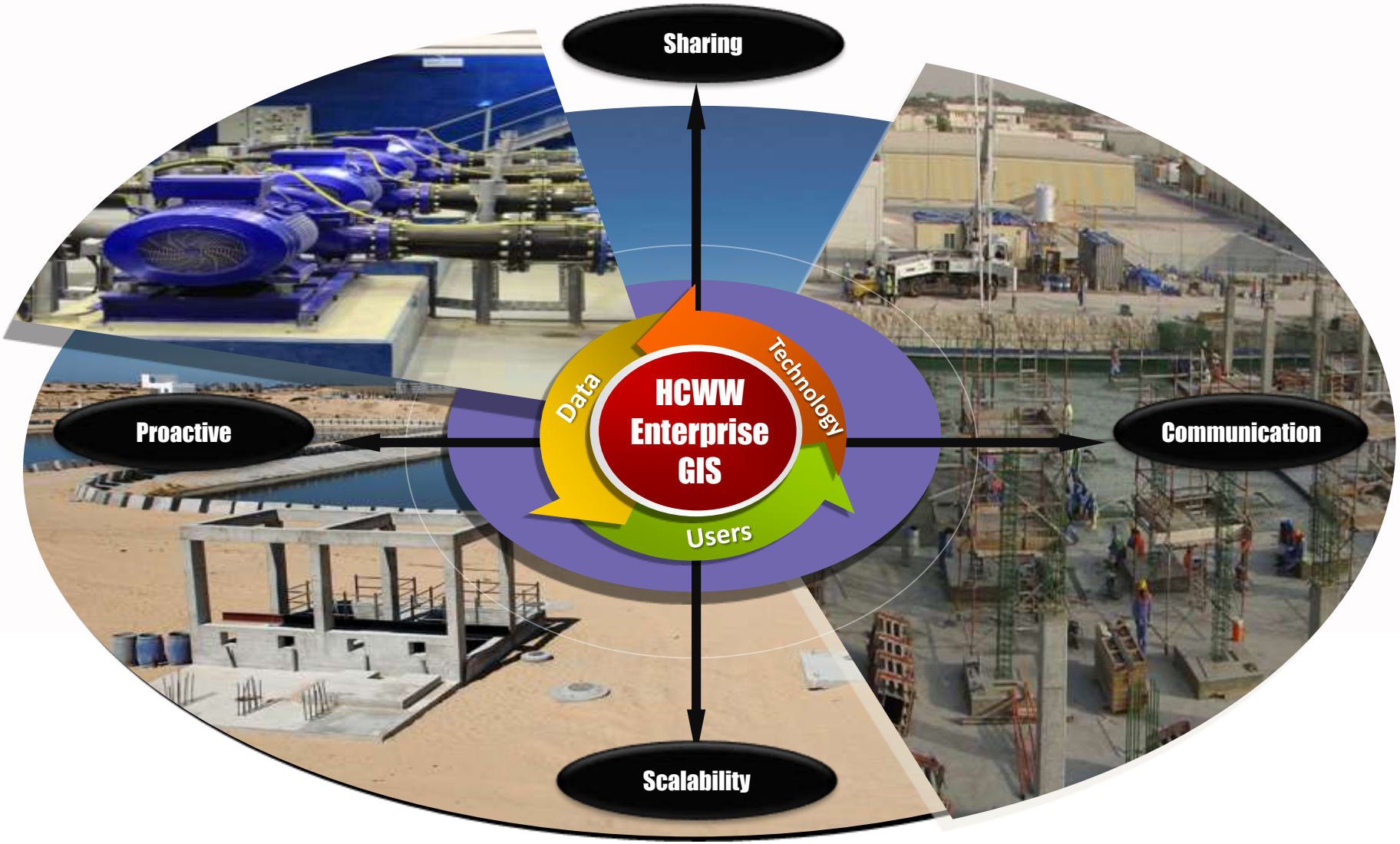
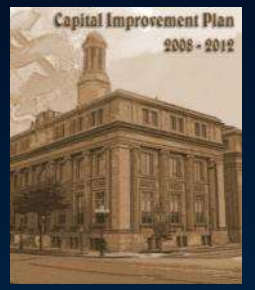
Vision


Sharing
Proactive
Communication
Scalability
Data
Technology
Users
HCWW
Enterprise
GIS

GIS Helps In Many Functional Areas….

Plant Operation

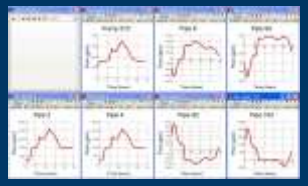
Maintenance



Planning

Water Quality Reporting

Construction



Hydraulic Modeling

Meter Reading

Administration

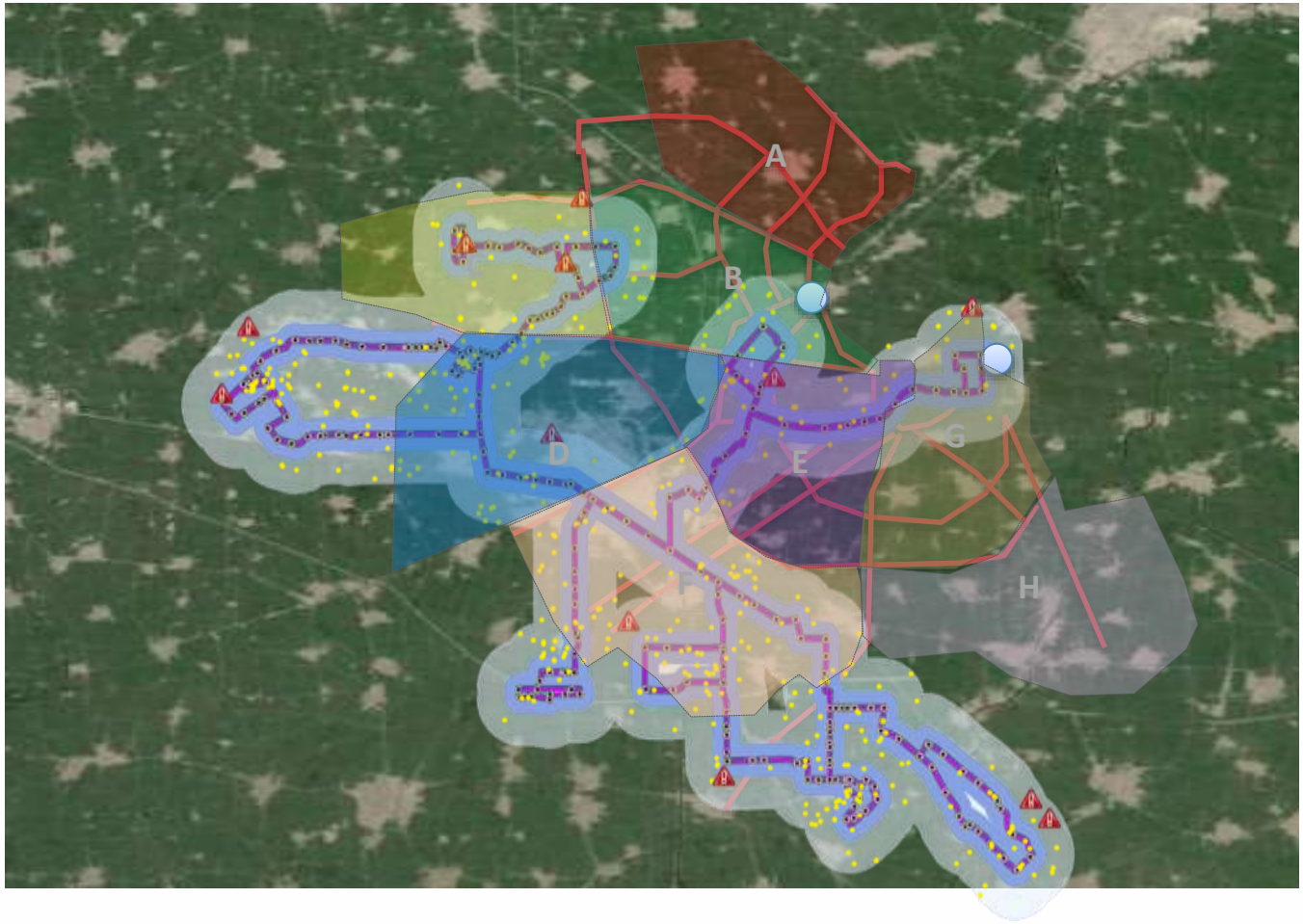
Customer Service

GIS Infrastructure

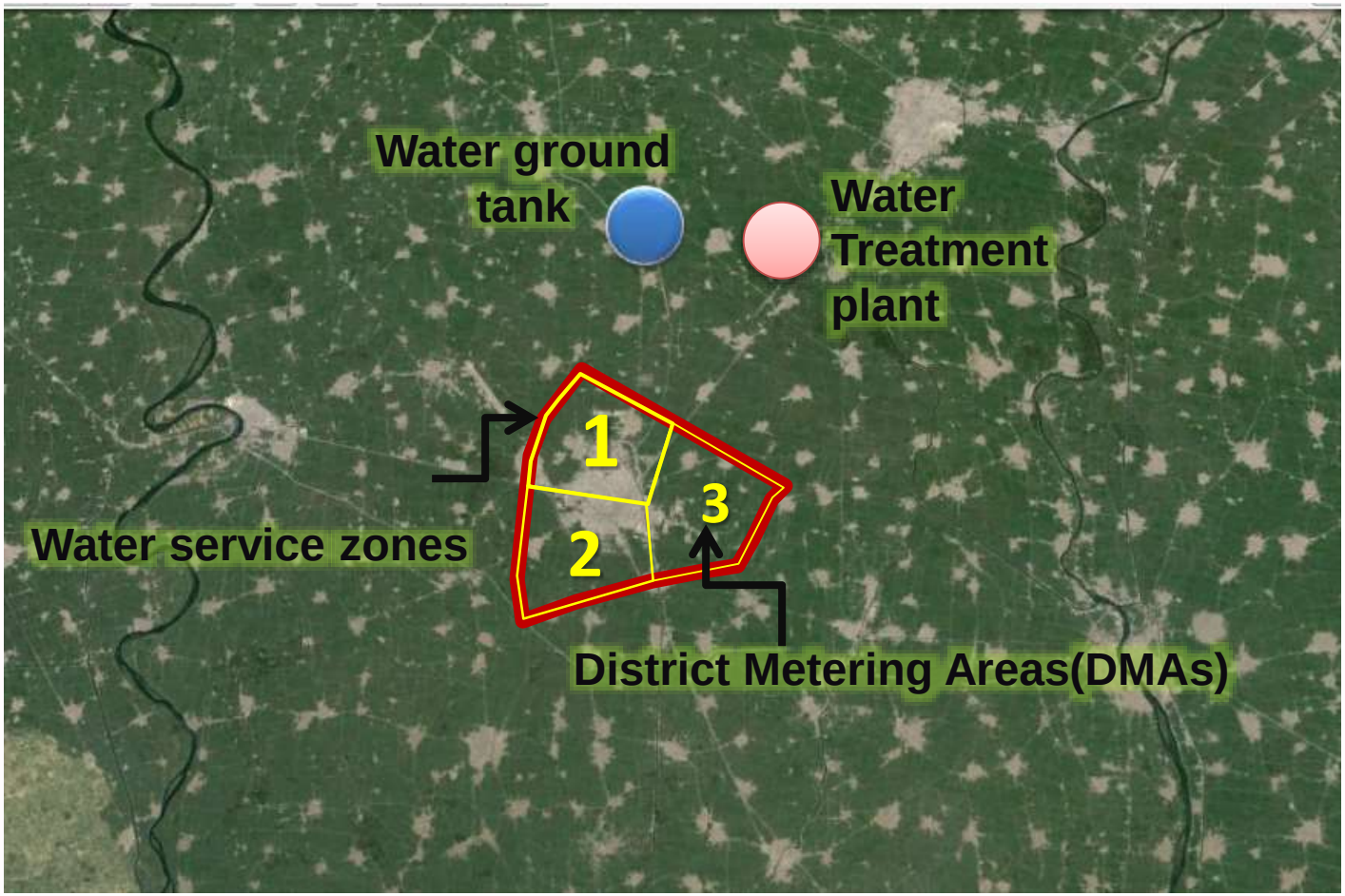
Location is the Common Element Among Data

Visualize your:

- World
- Features around you
- Service Areas
- Water Network
- Customers
- Alerts

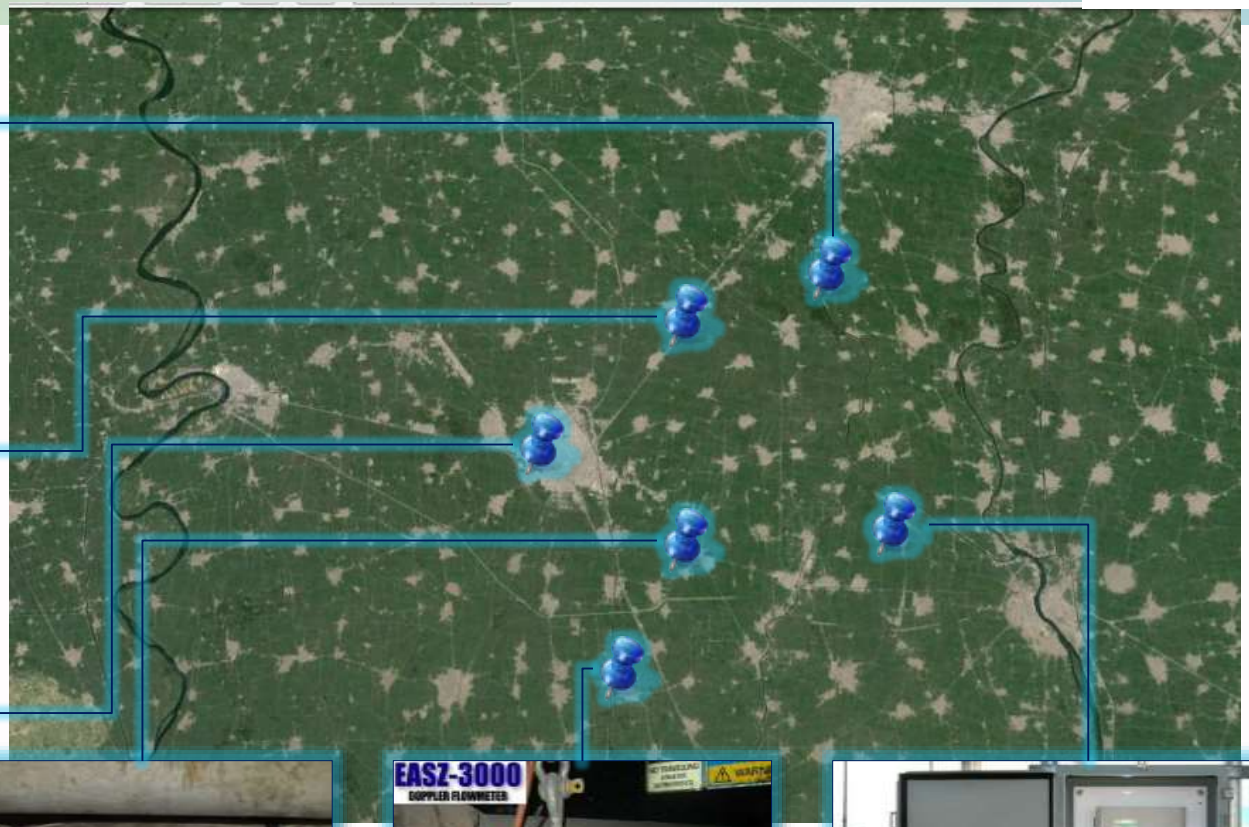


Water Network …



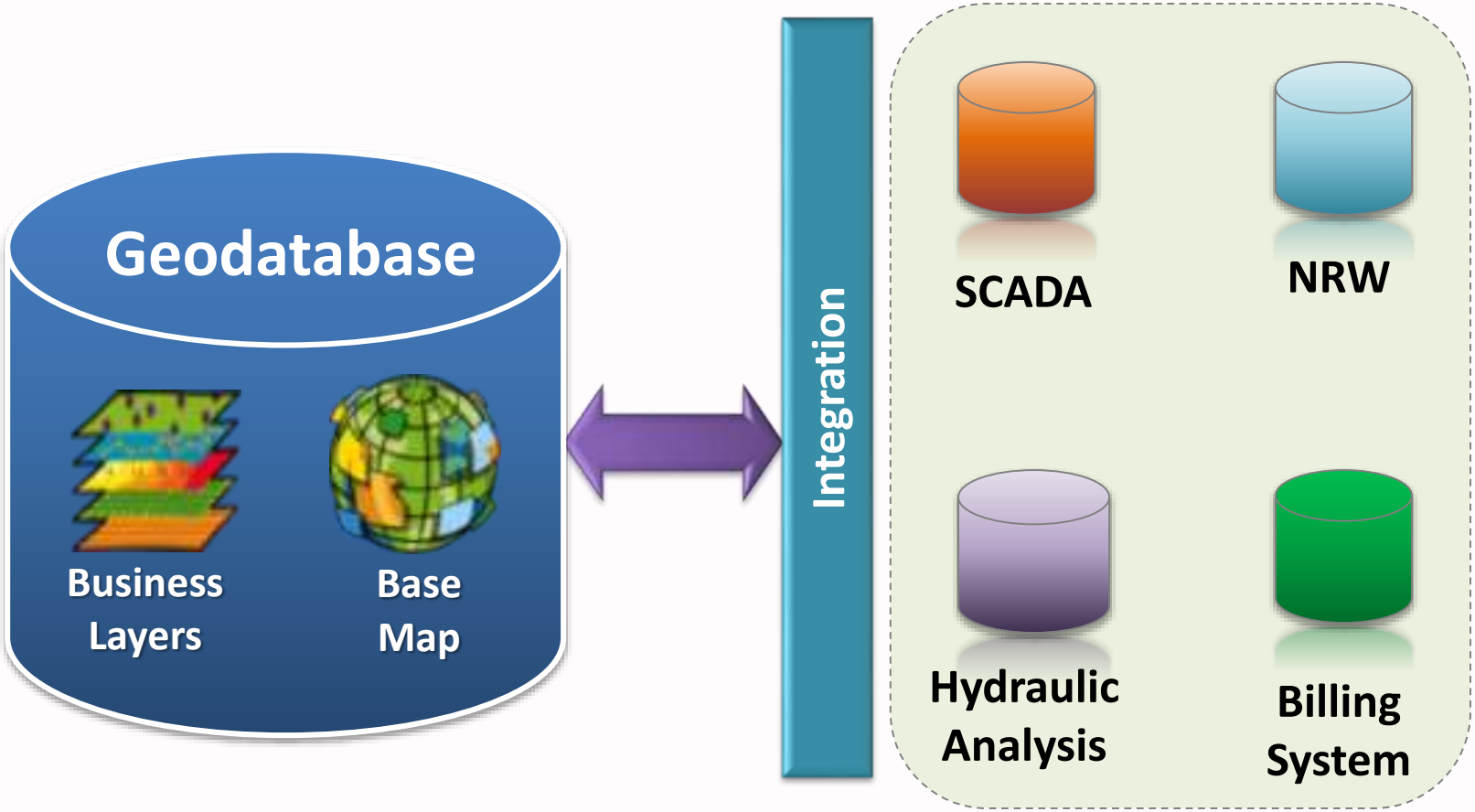
Water Network

Water Network …

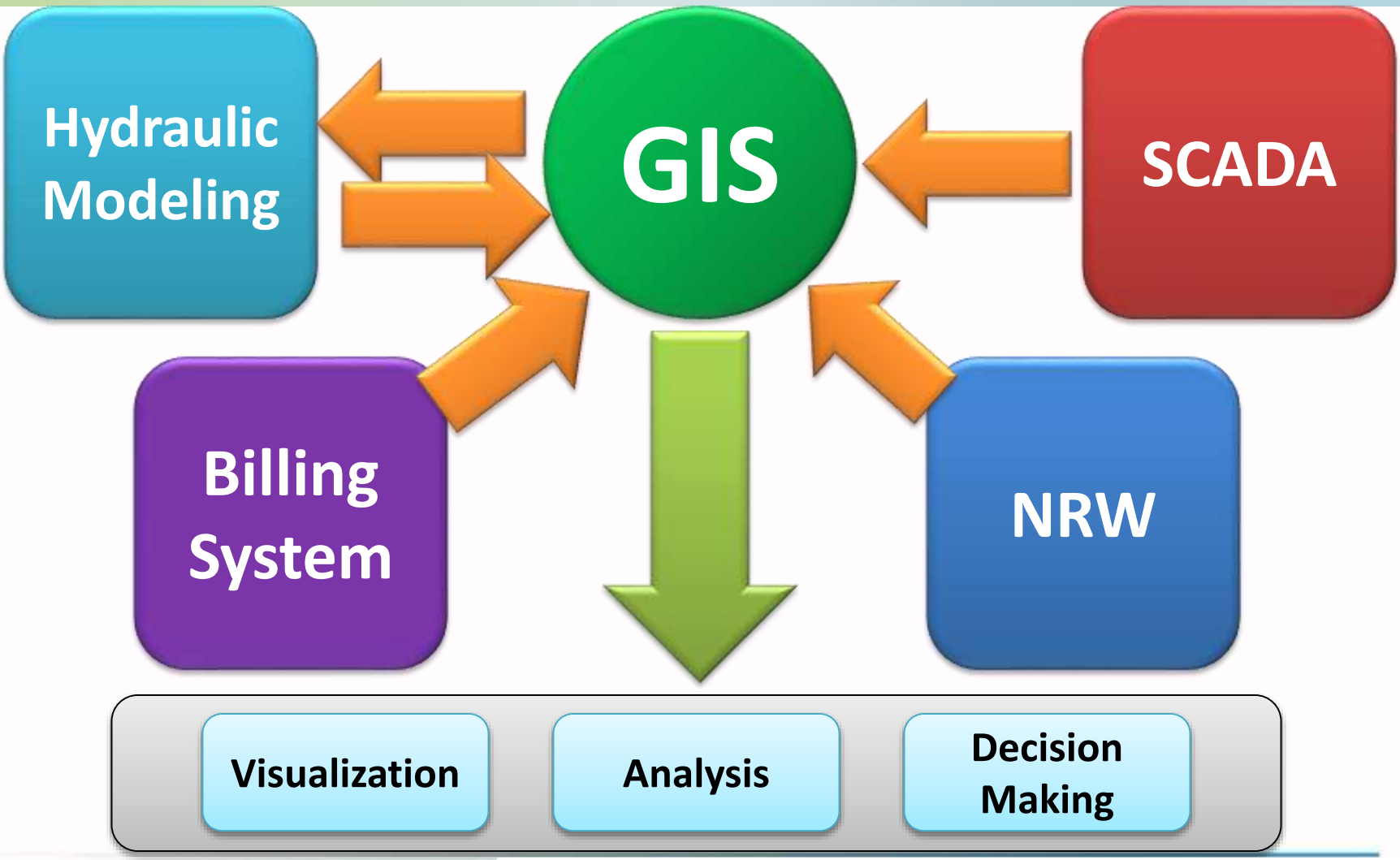


Building Geo-database

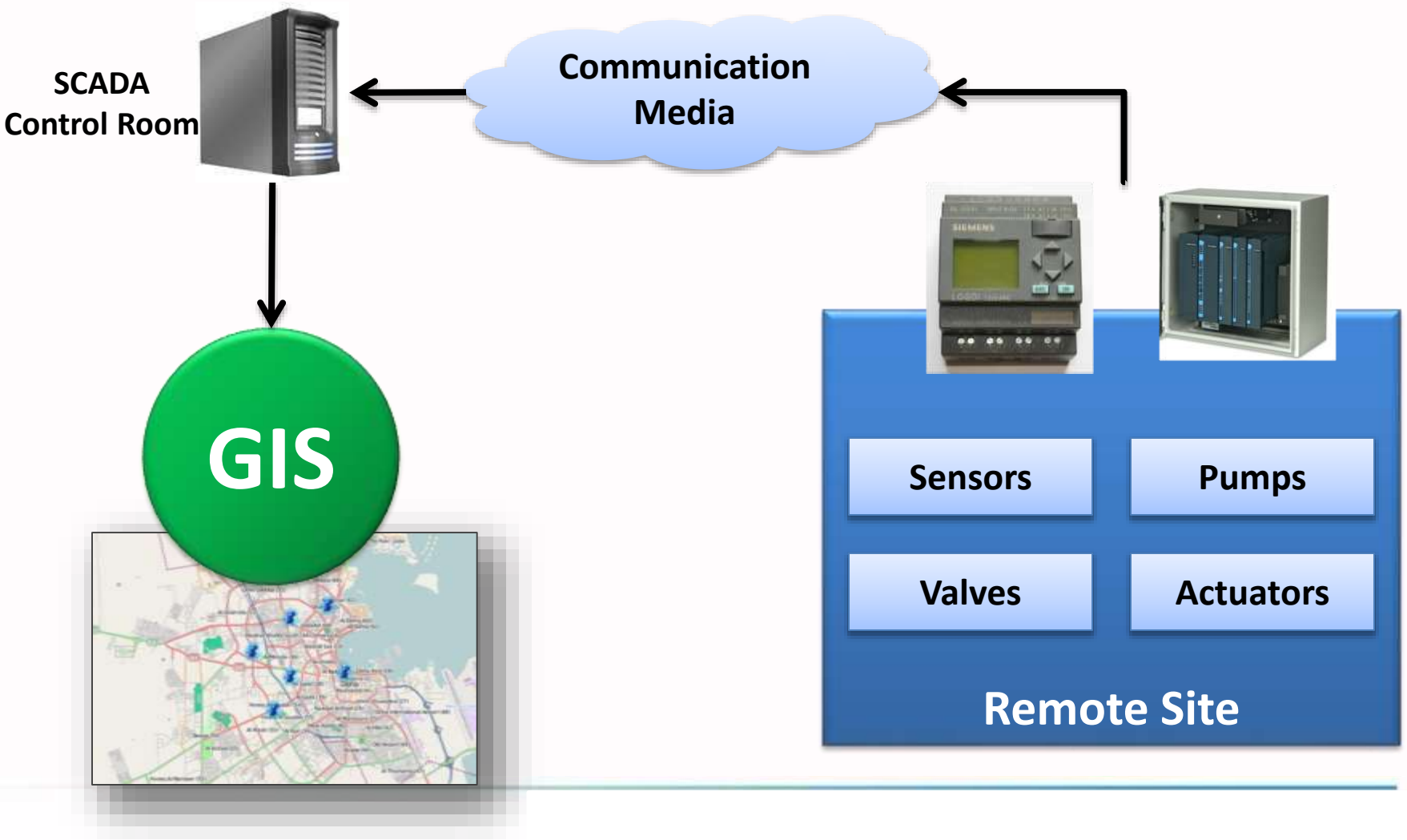
Infrastructure



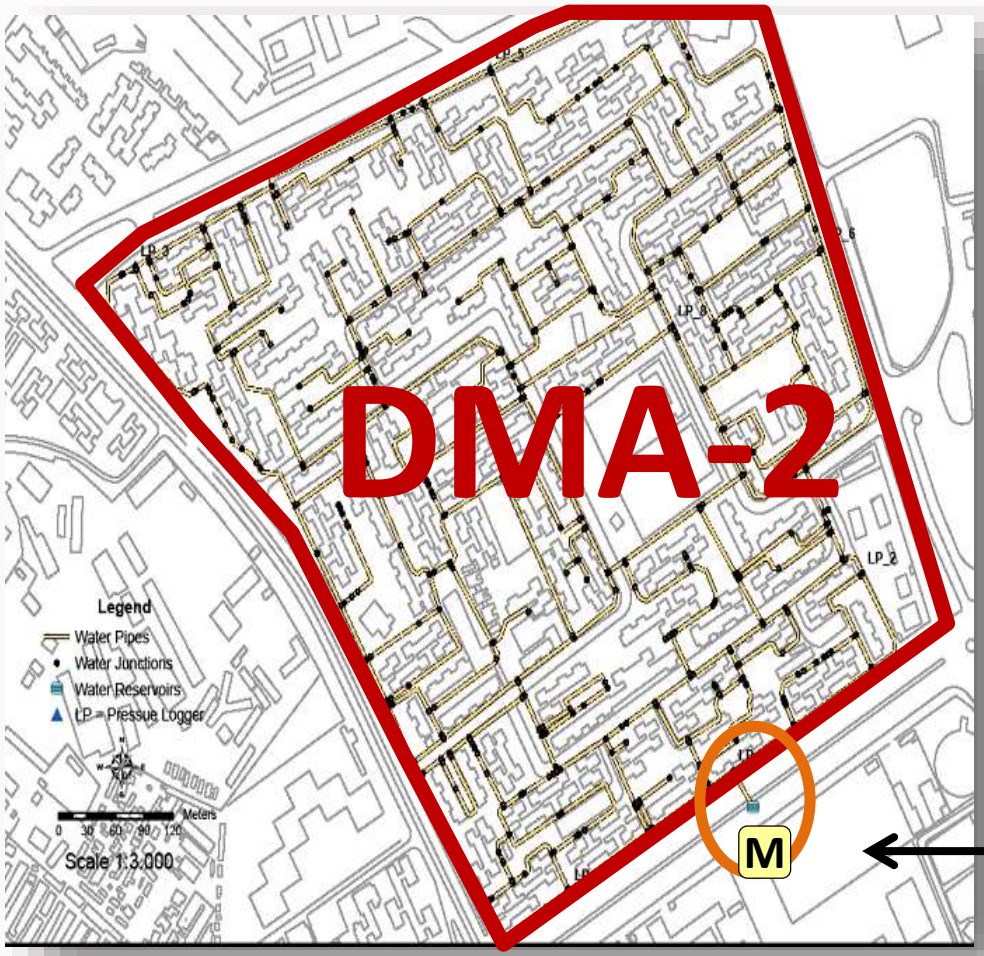
Integrations



Integration - SCADA

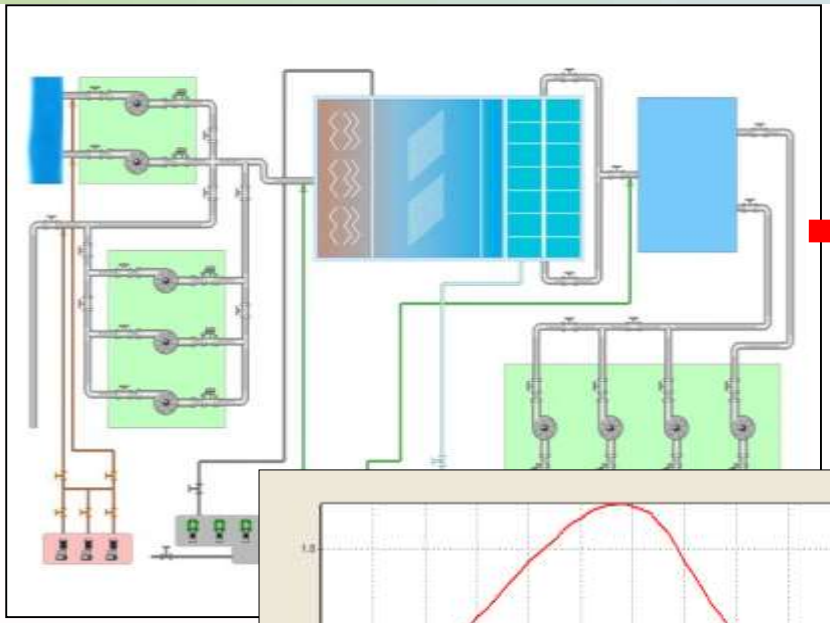


Visualize locations of SCADA measurements

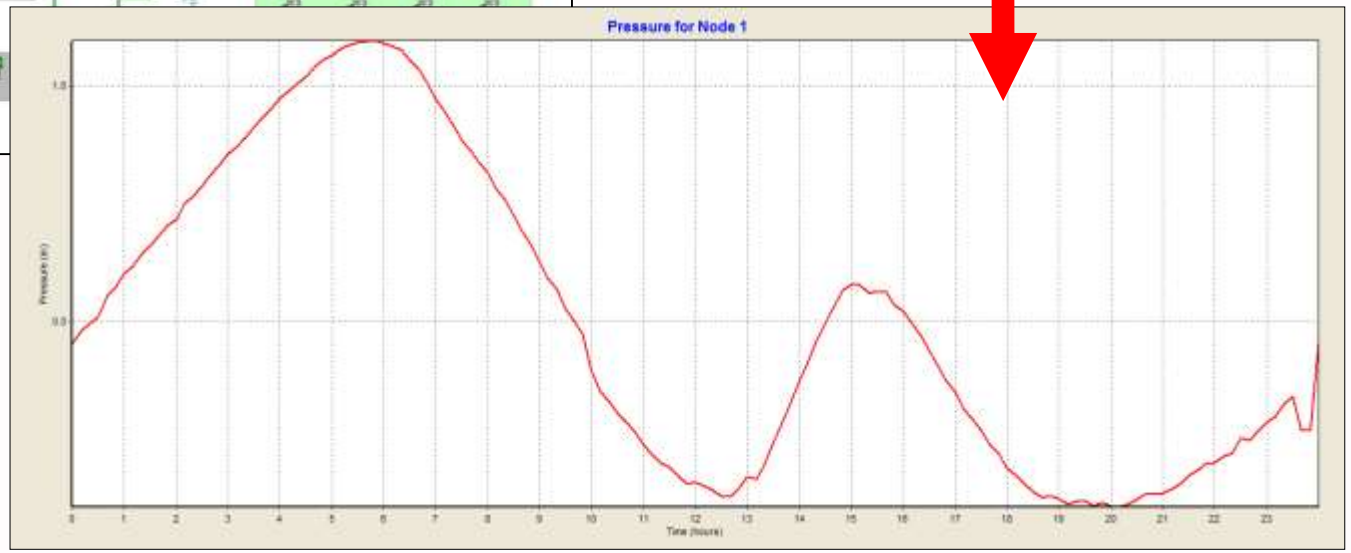


Locate the amount of distributed water (m^3) in each controlled zone.

Receive Measurements



DATA from SCADA
Tank Levels



Locations & readings of non-revenue water (physical & commercial)

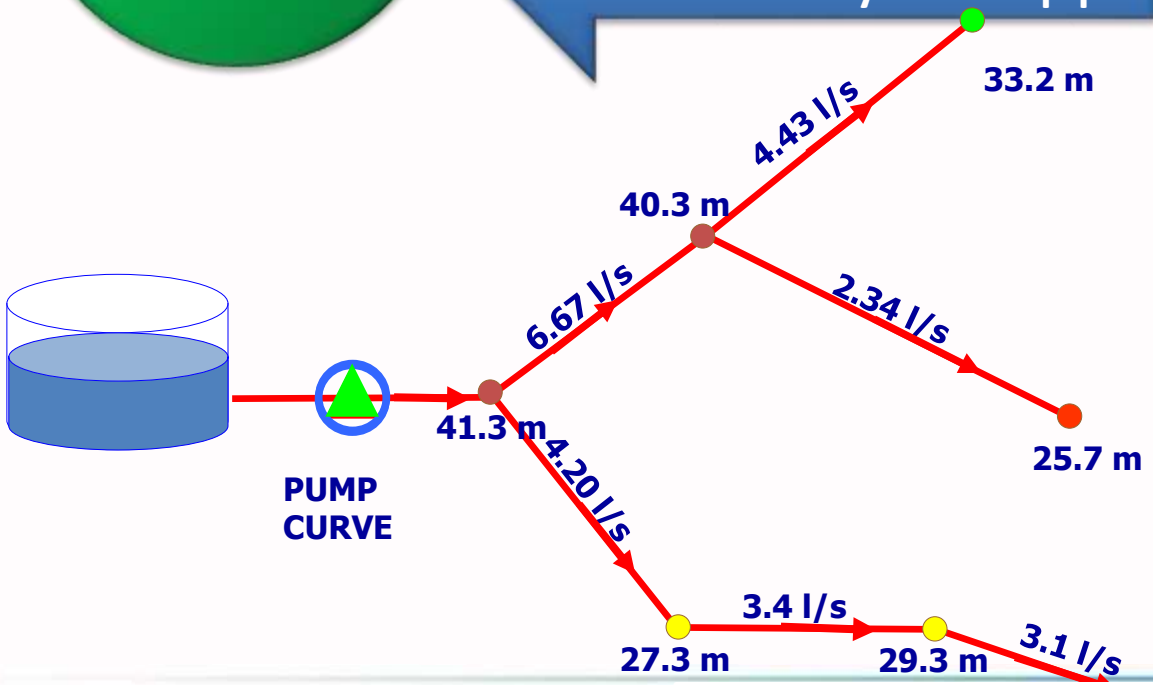
Noise Logger (physical leakage)

Integrations – Hydraulic Modeling

GIS

- SCADA Readings & locations
- Network Map

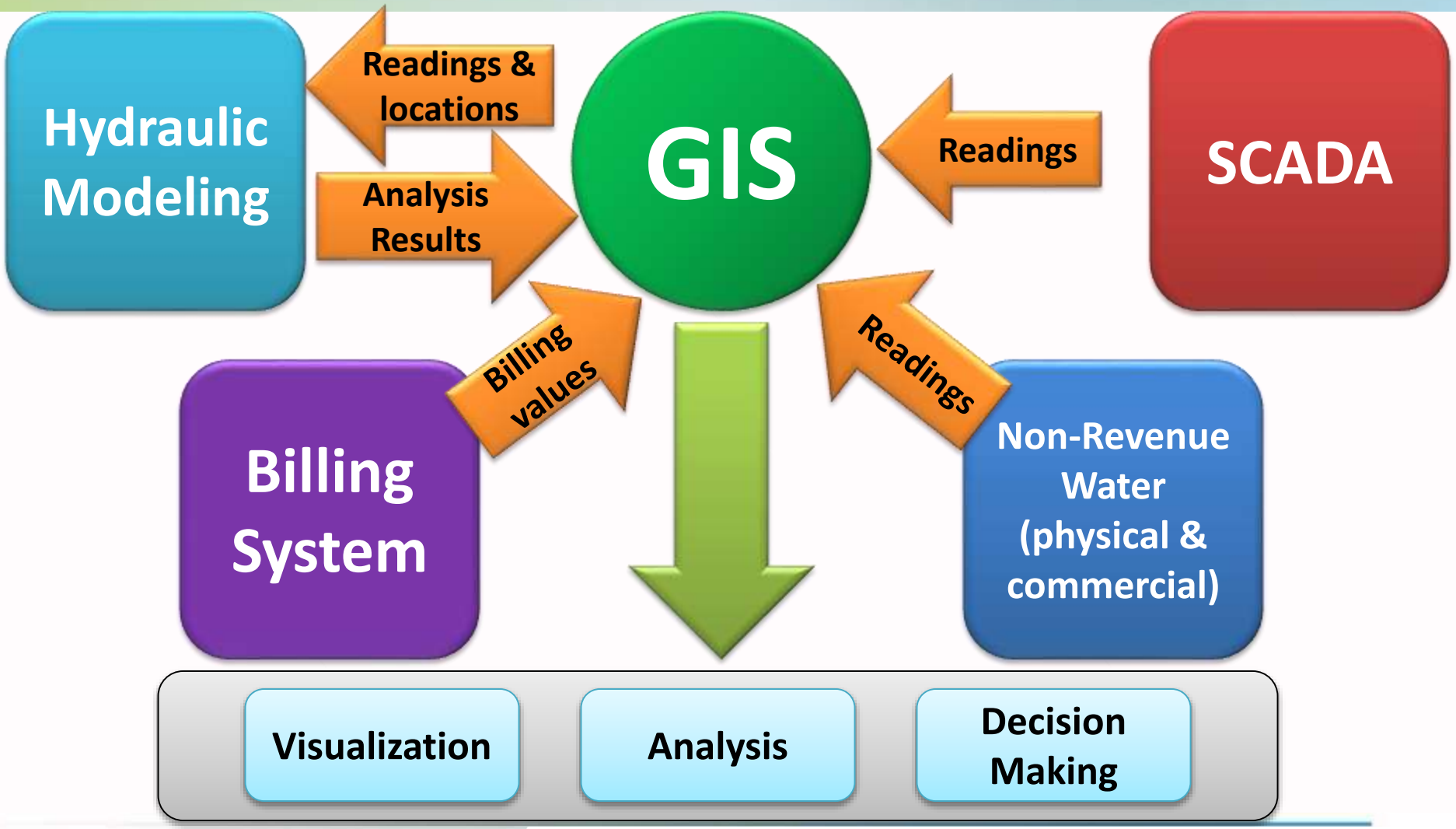
- Pressure in Each Node
- Flow &Velocity in each pipe



- INSTANT (Steady State) ANALYSIS
- EXTENDED PERIOD ANALYSIS
- WATER QUALITY ANALYSIS
- SCADA – REAL TIME MODELLING
- FIRE FLOW ANALYSIS
- AUTOMATED PIPE CALIBRATION
- NETWORK OPTIMIZATION

Hydraulic Analysis

Integrations



Web-Based GIS for Sustainable Water Management System

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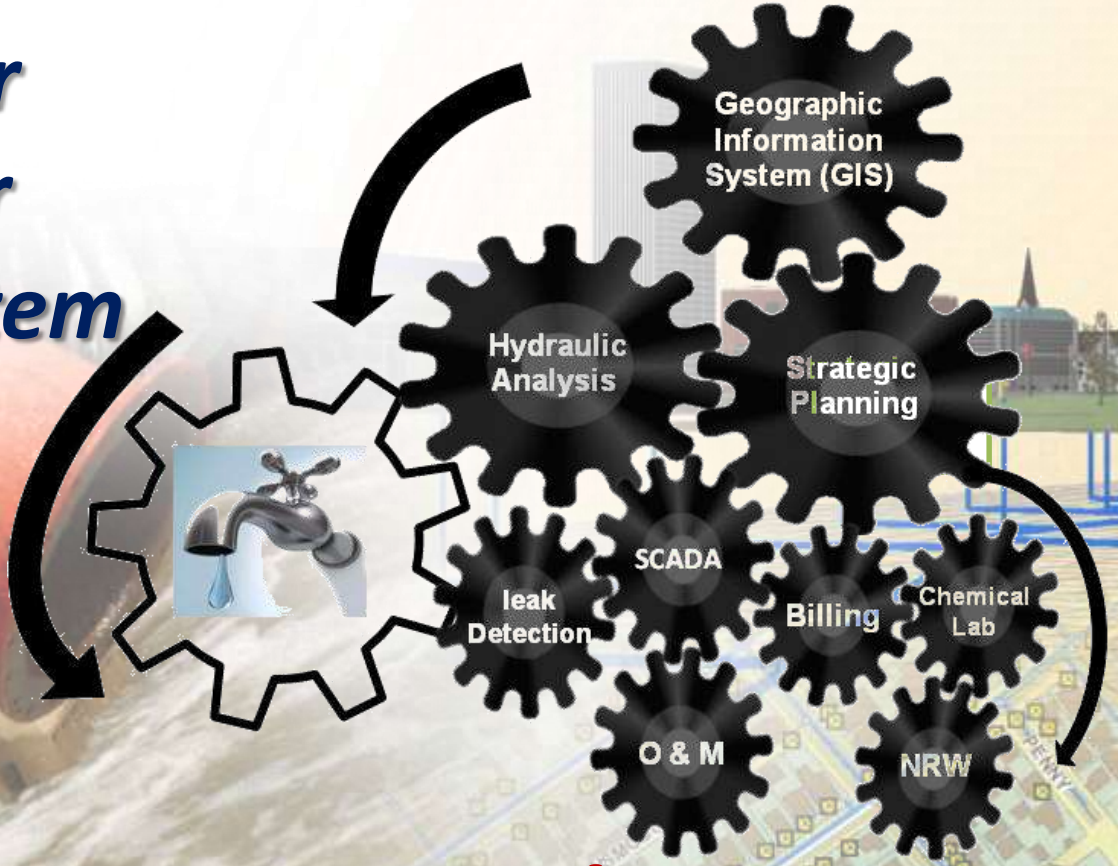

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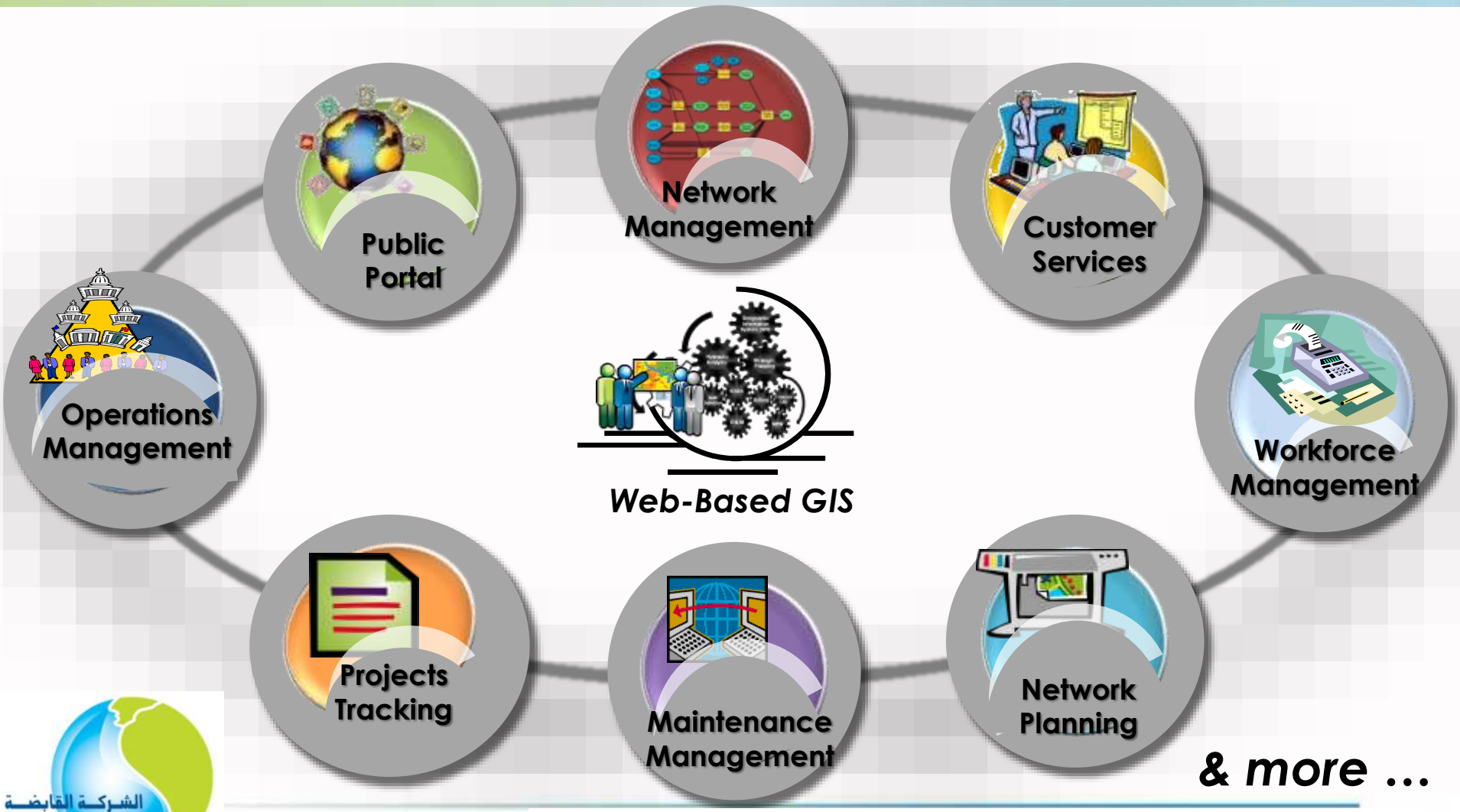
Connecting Gears

Web-Based GIS for Sustainable Water Management System



Network Operations

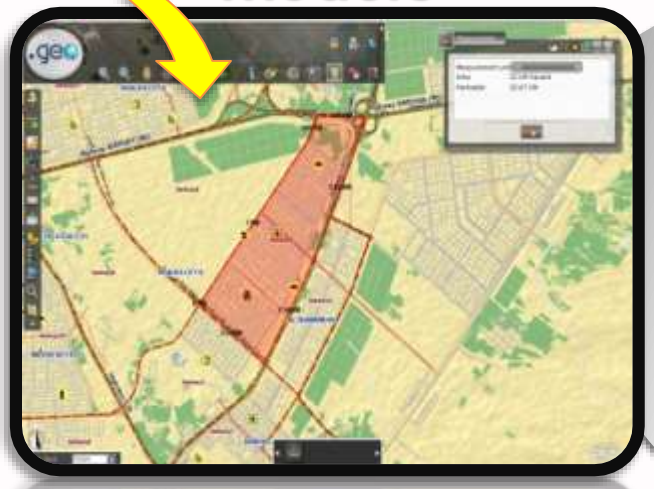
DATA

GIS DB

SCADA

Data

Network Operations Module



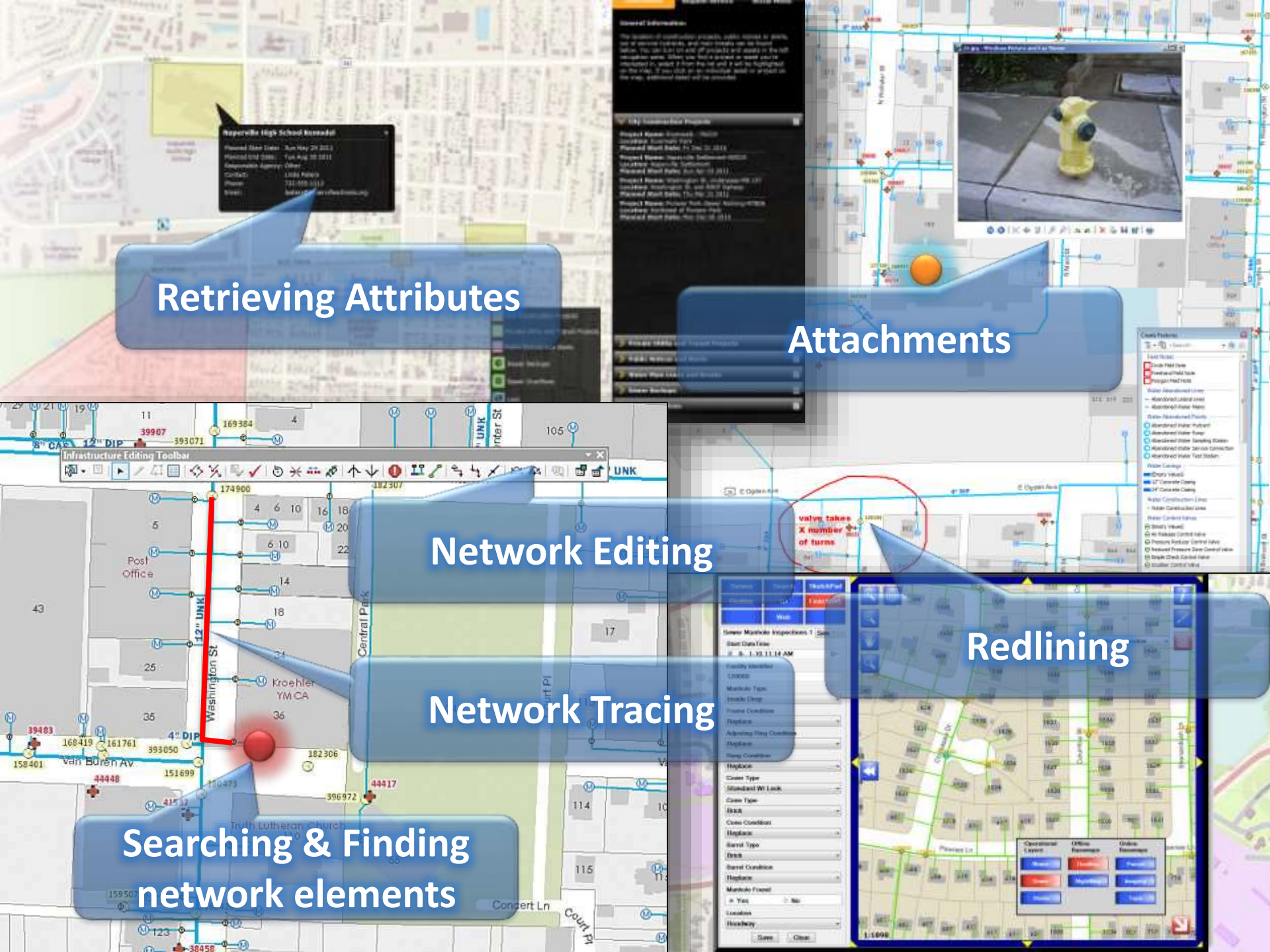
Aim:
Managing for water network components from editing and updating, network tracing, schematic …etc.

Main Functions

- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Map Classification
- Rules & Validation
- Editing
- Extracting
- Tracing
- Schematic
- Network Analysis
- Plotting

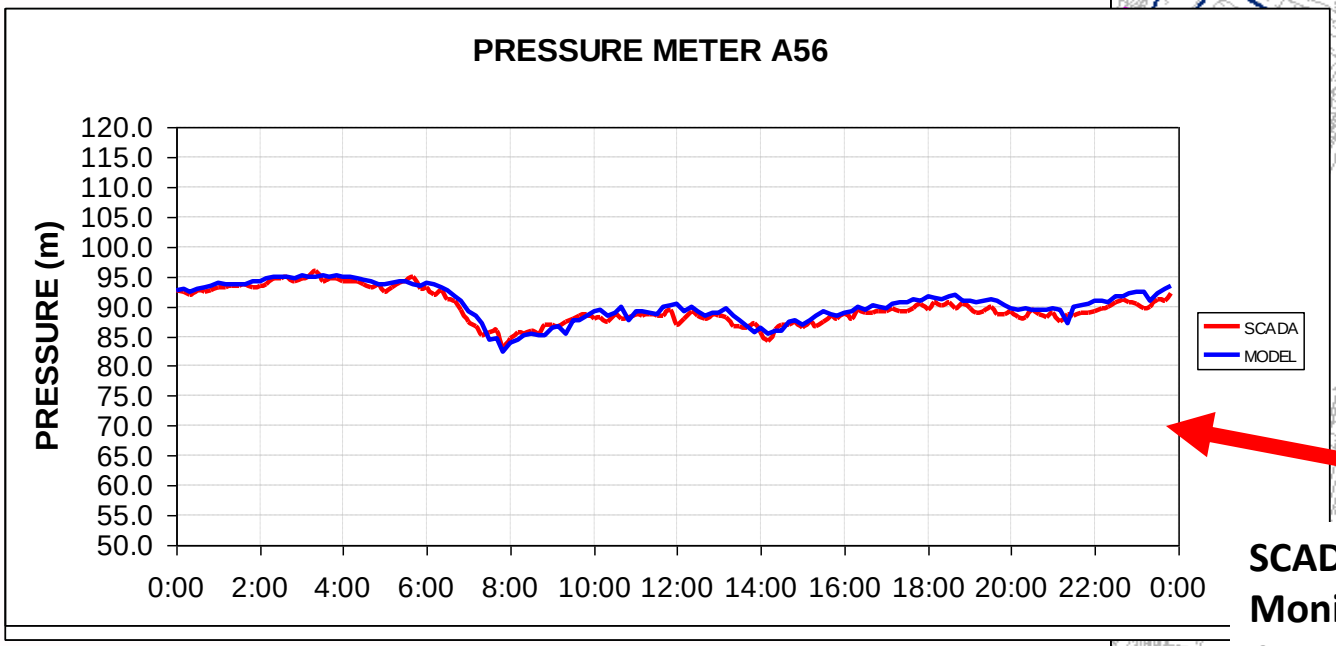
Can You Access Accurate Information about Your Assets?

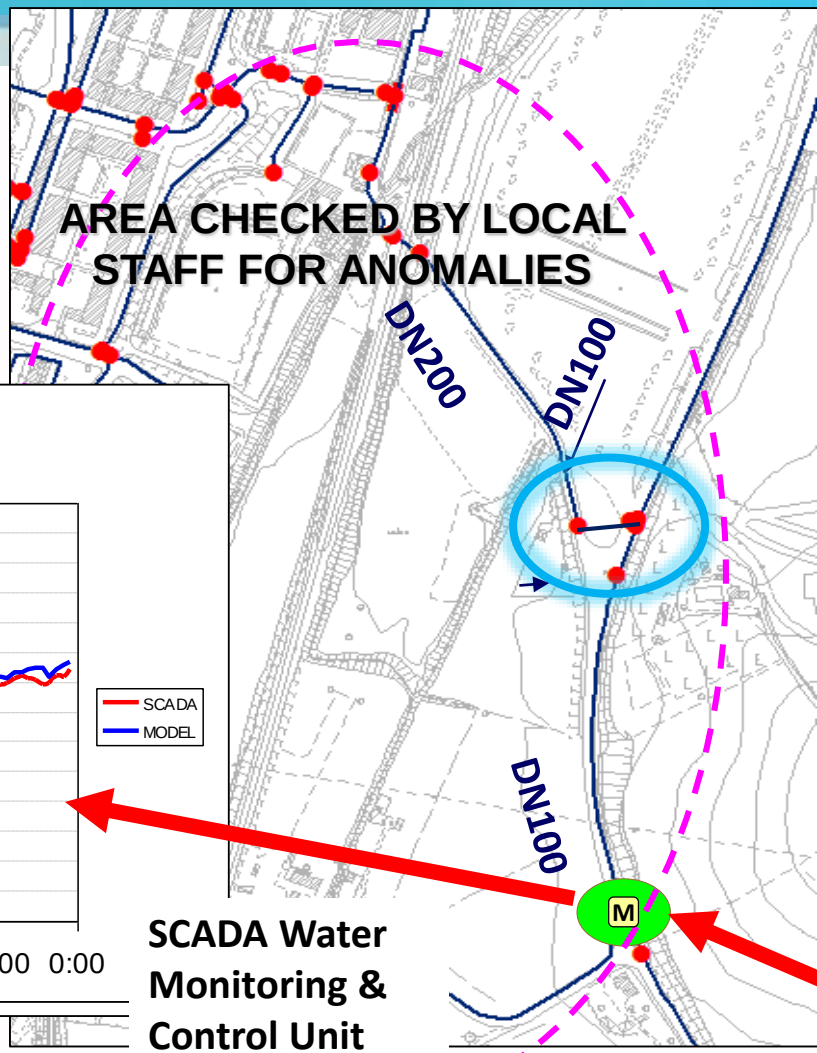
…It May Be Due to the Difficulty of Maintaining Your Asset Information


Retrieving Attributes
Attachments
Network Editing
Redlining
Network Tracing
Searching & Finding
network elements

Field Verification

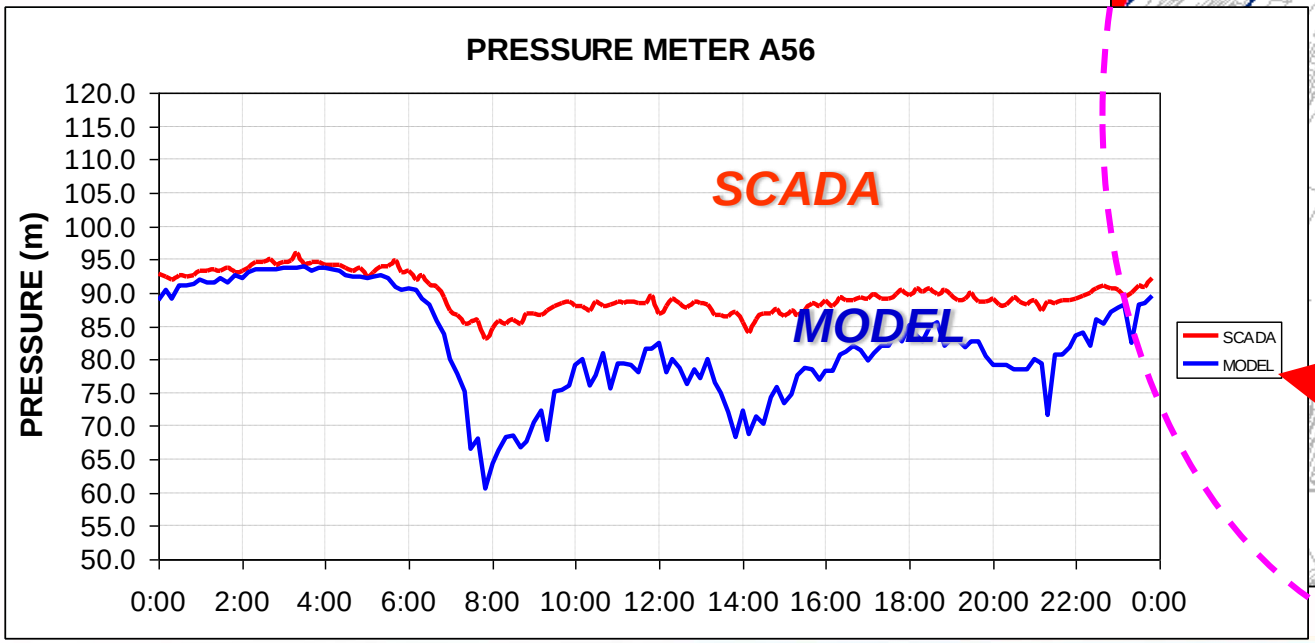
1. MODEL VERIFICATION SPOT AN ANOMALY
2. SOMETHING IS WRONG IN GIS or SCADA
3. CHECK GIS AND SCADA

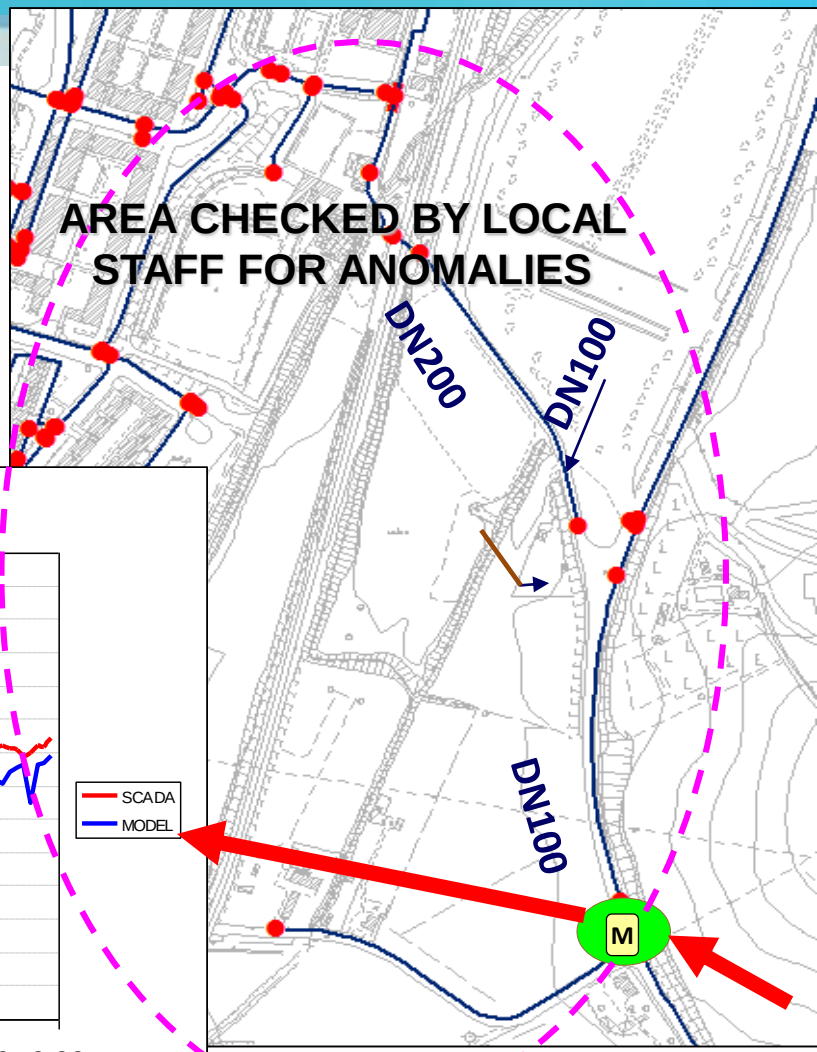




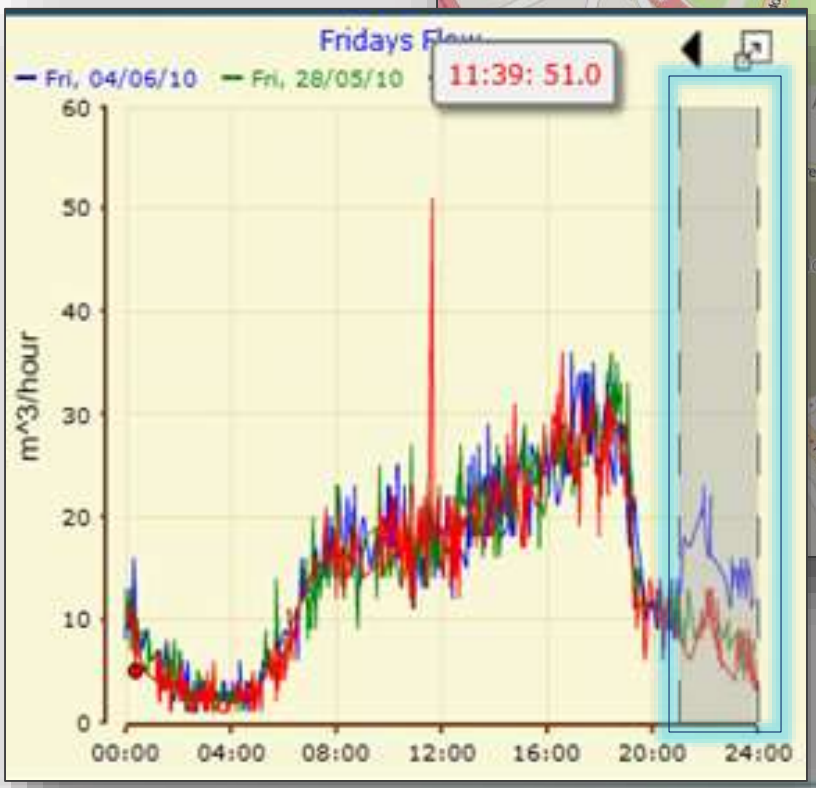
Probable Leakage Locations

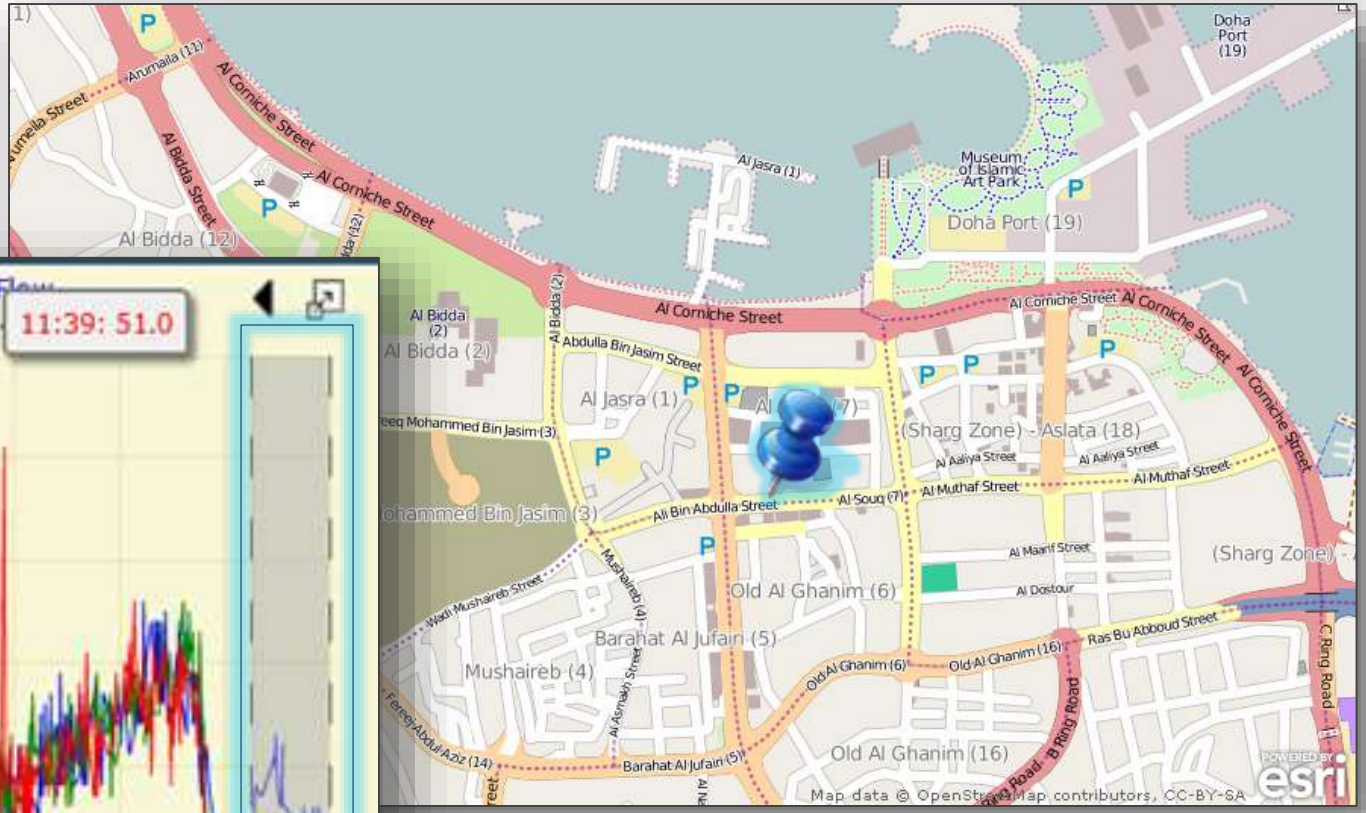
Comparison between the measured pressure by SCADA unit (actual existing state in red) and the hydraulic model (blue) will significantly indicated the possibility of leakage (commercial & physical)



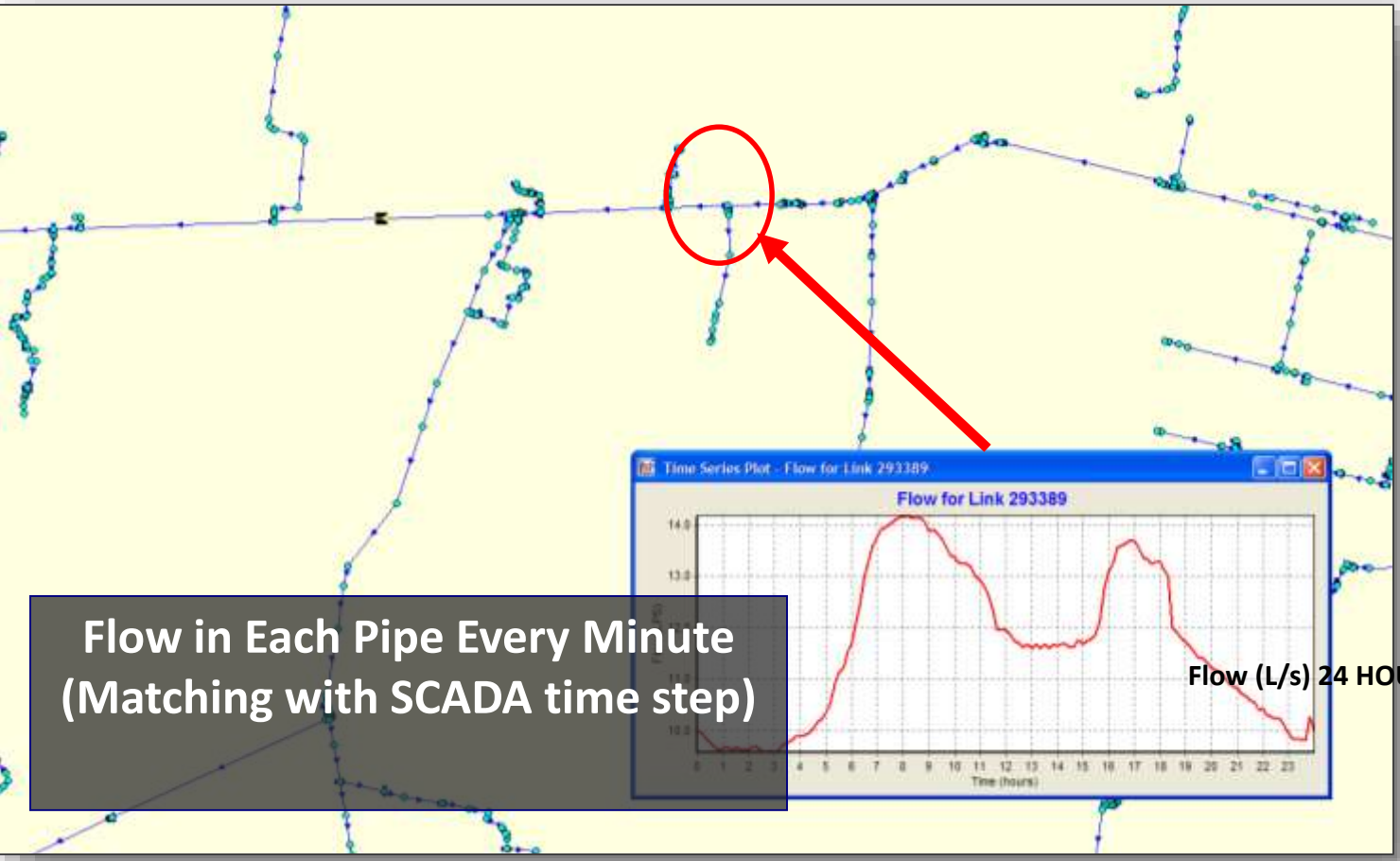


Probable Leakage Locations





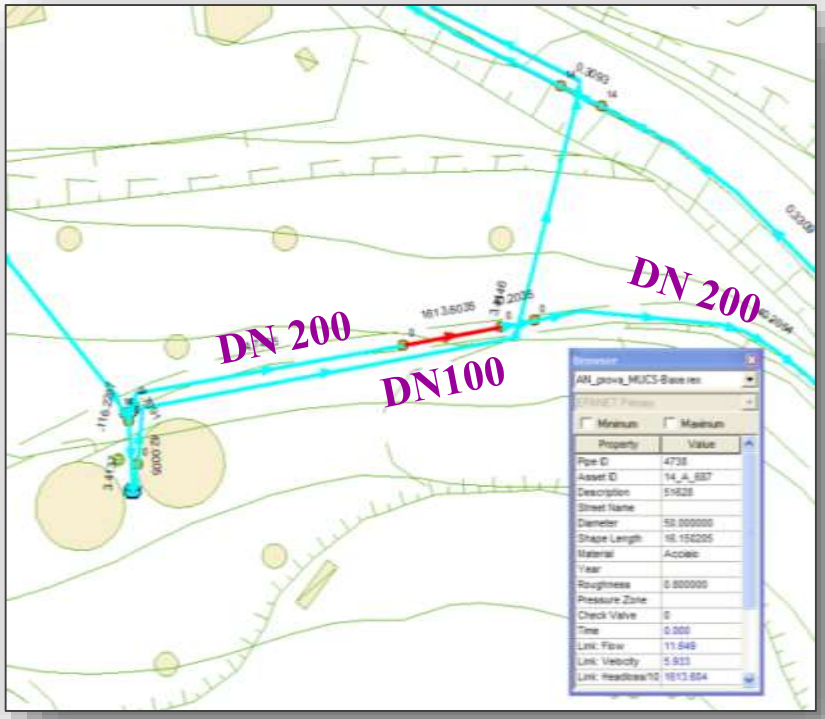
Dynamic Hydraulic Modeling



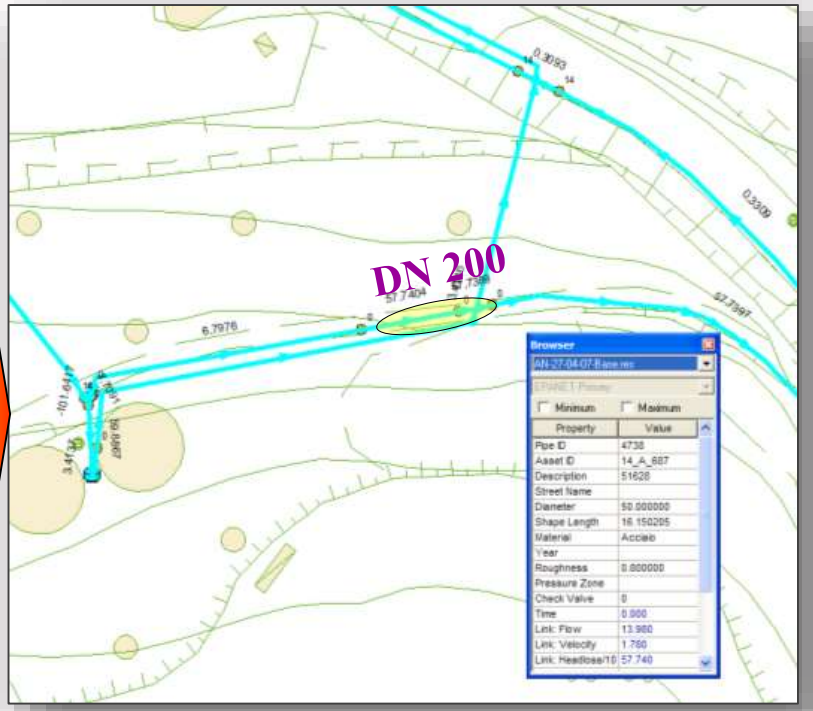
Flow in Each Pipe Every Minute (Matching with SCADA time step)

Network Optimization

Detection of pipes with main head loss (red)



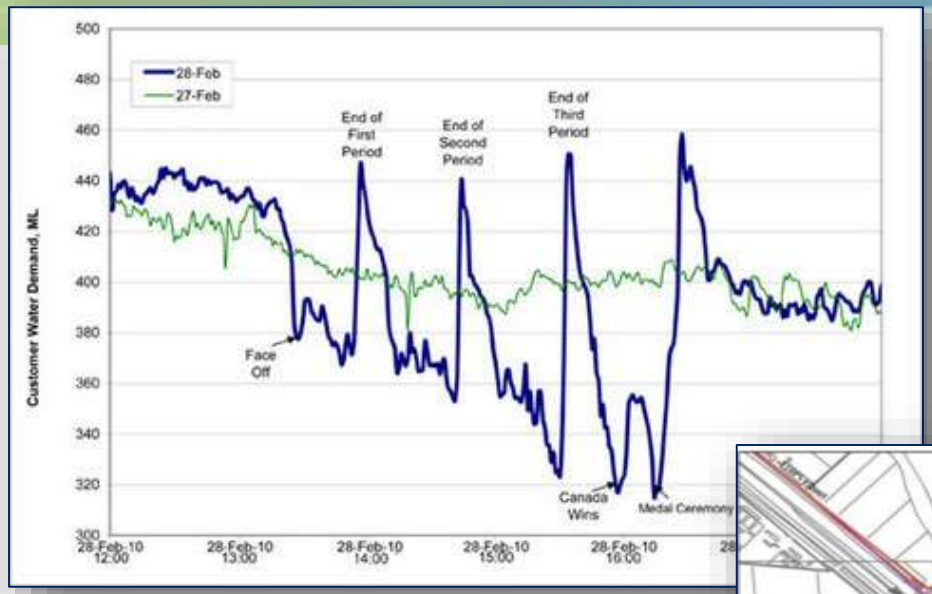
head loss in the red pipe = 1.613 bar

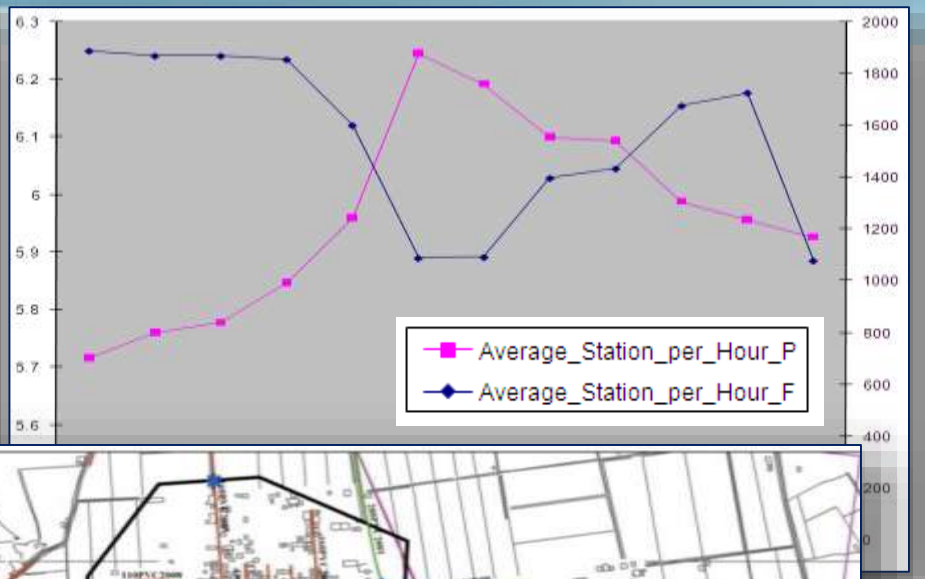


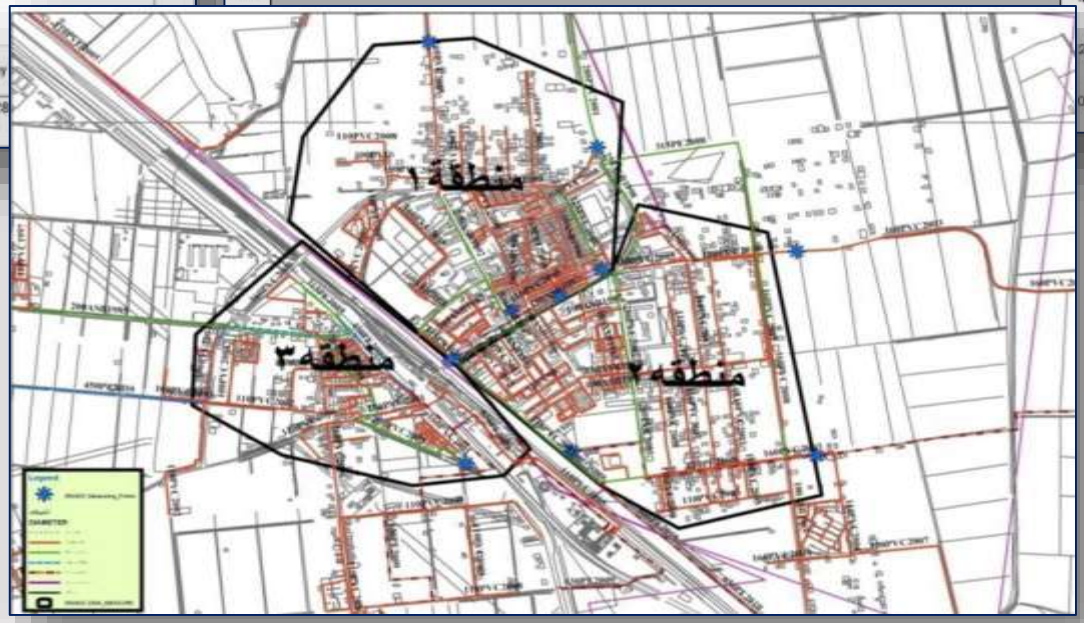
head loss in the proposed yellow pipe = .57 bar

New proposed pipe (yellow) reduced the head loss and increased the pressure.

Monitoring

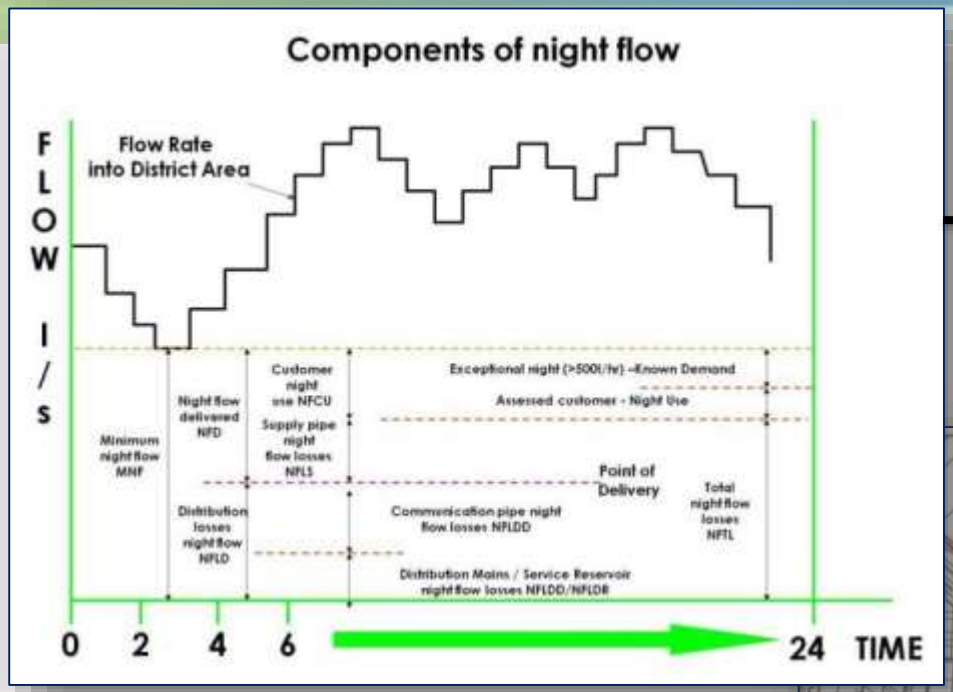


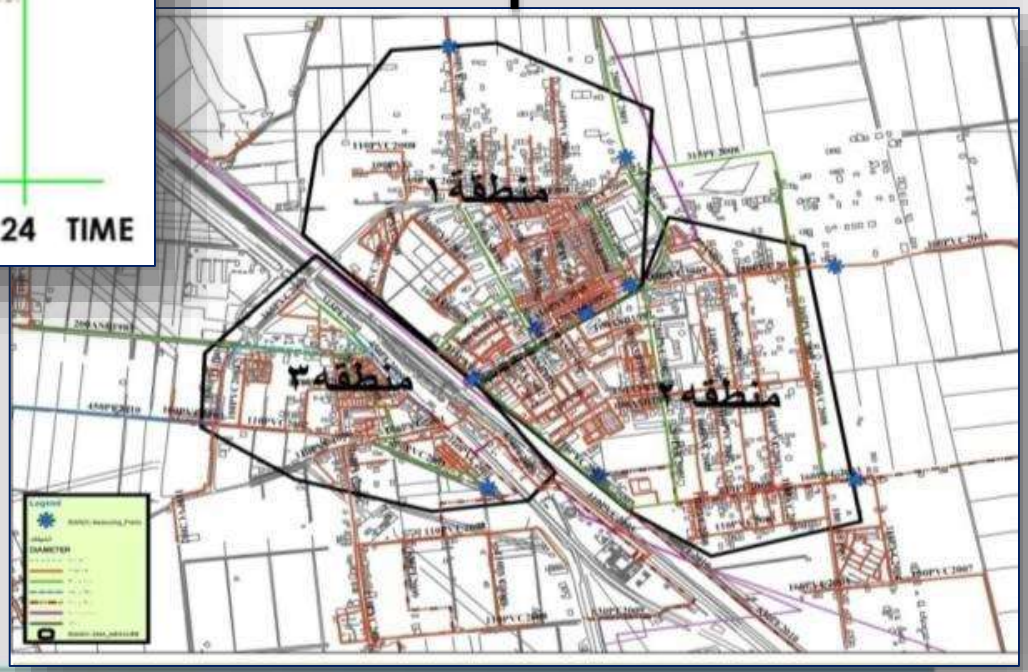




Monitor and analyze the fluctuation and behavior of the distributed water and consumption patterns in each controlled zone.

Network Optimization

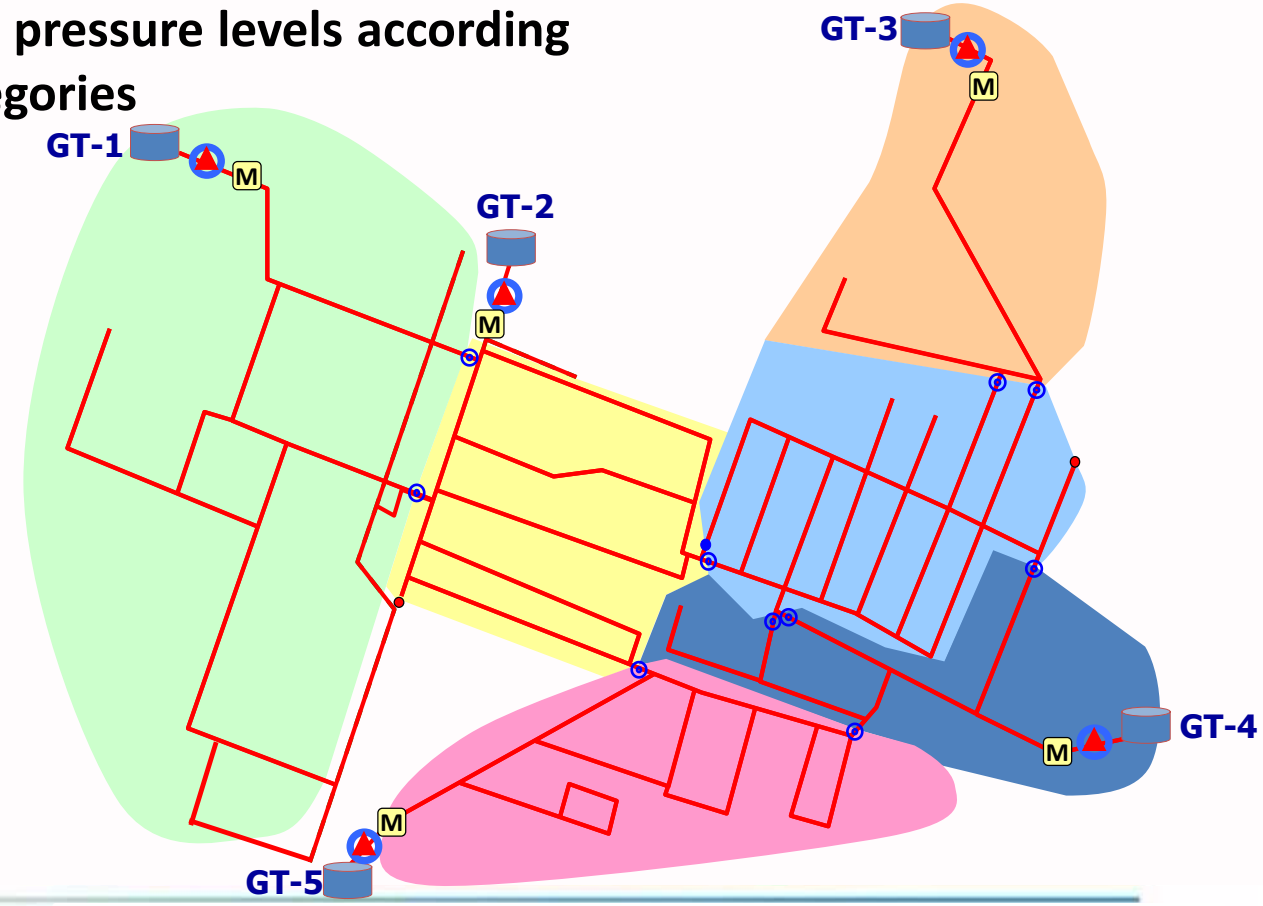




Establish a base line for the component of night flow for each controlled zone, which will help in the optimization for the management of operation and distribution.

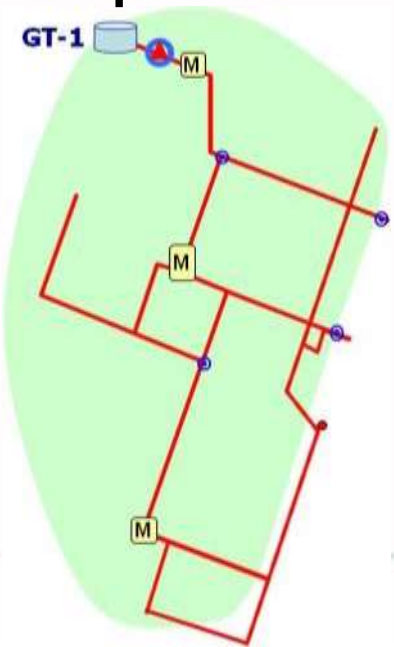
Distribution Automation & Network Optimization

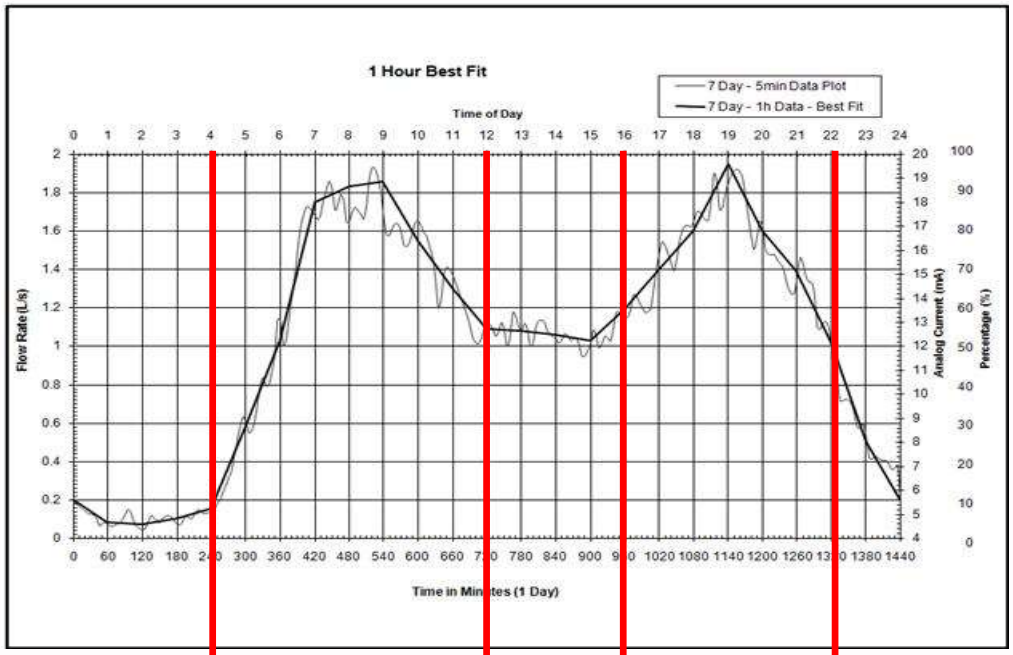
System optimized by integrating the hydraulic modelling and SCADA with pumping strategy (energy savings) to sustain optimum pressure levels according to various consumption categories



Distribution Automation & Network Optimization

pump controller with variable speed adjustment





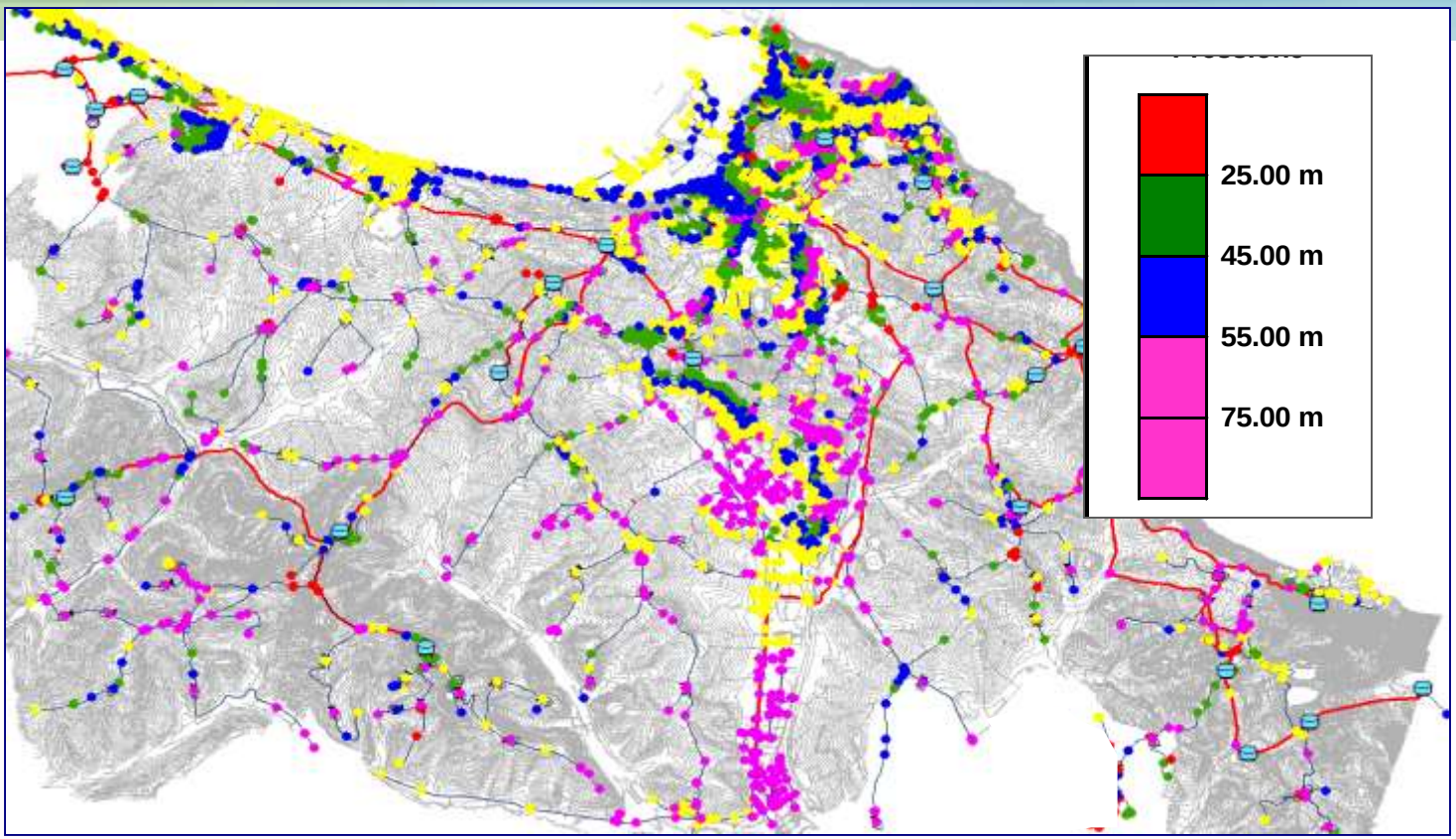
Period - 1 | Period - 2 | 3 | Period - 4

Consumption pattern as function in flow and/or pressure

Consumption pattern should be divided according to

1. **0 – 24h consumption pattern and 24/7 (to recognize behaviour variation between working / non working days,….etc).**
2. **Land use nature (industrial, residential, agriculture, commercial, mixed,……etc) because each has its specific behaviour.**

Visualize & Monitor Pressure

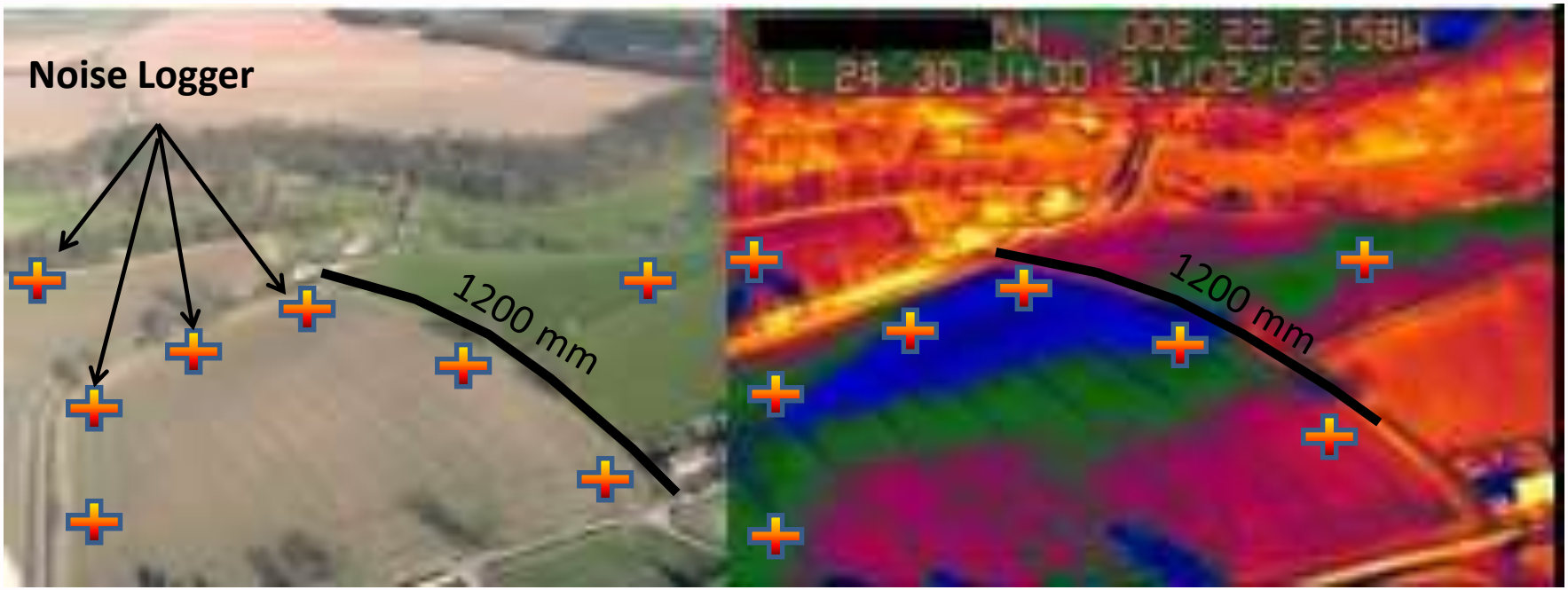


- **High pressure zones >>**

high probabilities of burst & increased levels of physical leakge.

- **Low pressure zones >>** customer ccomplains

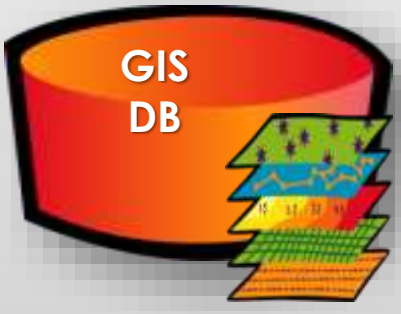
Visualize locations of Noise Loggers and probable leakage

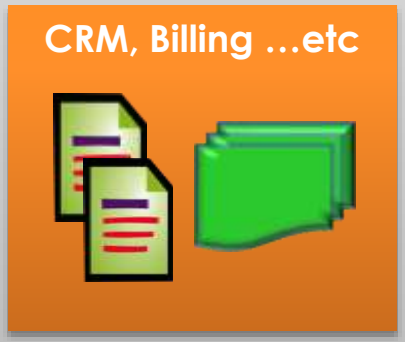


Visible photo on left and leak photo on right. The water leak from the transmission main shows up as a dark blue area.

Customer Service

DATA





Data

Customer Services Module

Aim:
Managing mobile workforce, request for services, statues, monitor crew and track work orders …etc.

Main Functions

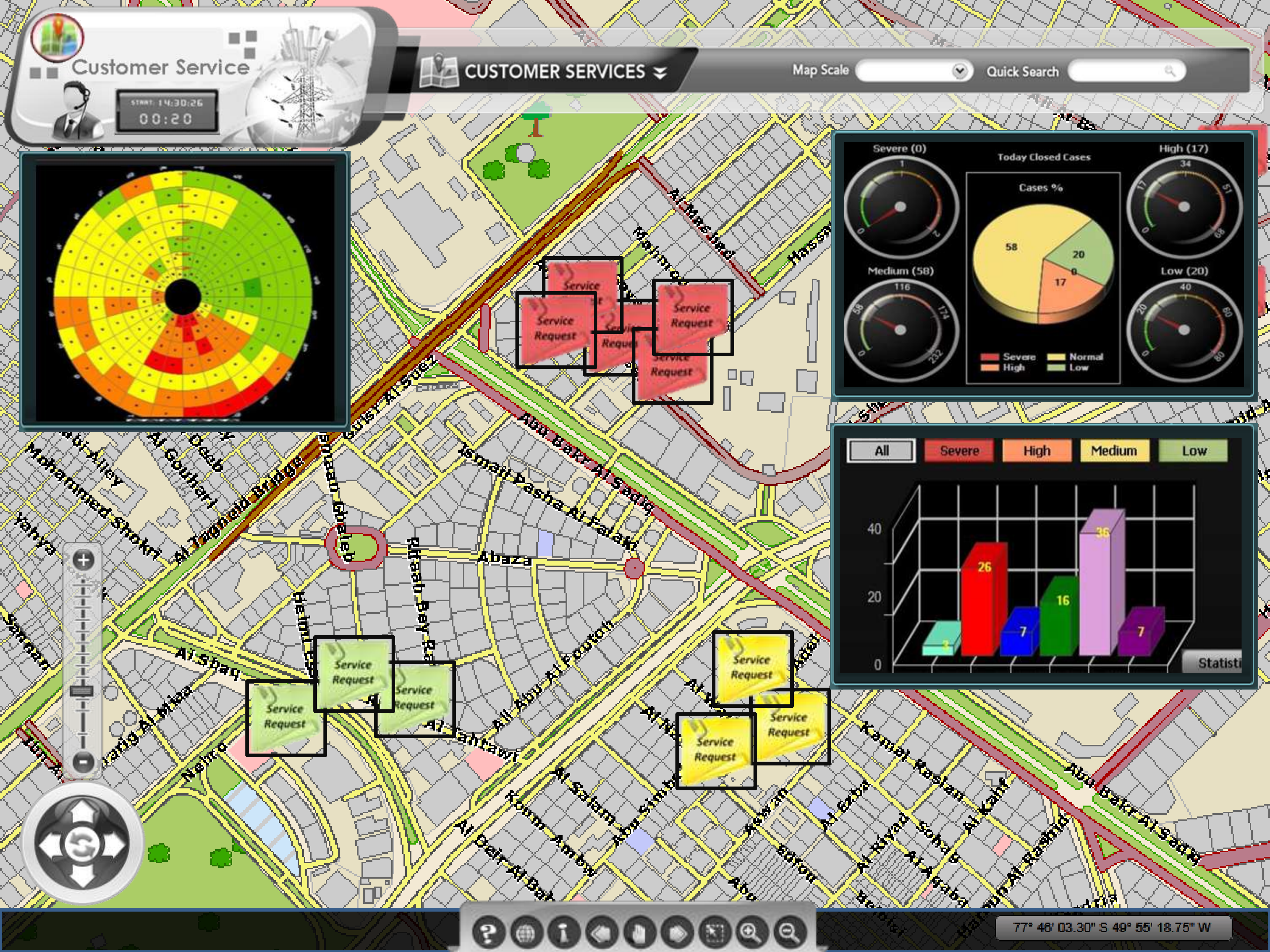
- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Receive Call
- Locate Customer
- Locate Complaint
- Locate/Show Fault
- Advanced Geo-Analysis
- Close Call
- Reporting


Customer Service
00:20
CUSTOMER SERVICES
Map Scale
Quick Search
Locate customer
Generate trouble tickets
Query & search
Locate Customer
Fixed no. :
0235731127
Customer Name :
Mohsen Amin
Address :
454 El Ahram El Giza
LOCATE
CANCEL
Overview map
6 اكتوبر
الجيزة
القاهرة
77° 46' 03.30" S 49° 55' 18.75" W

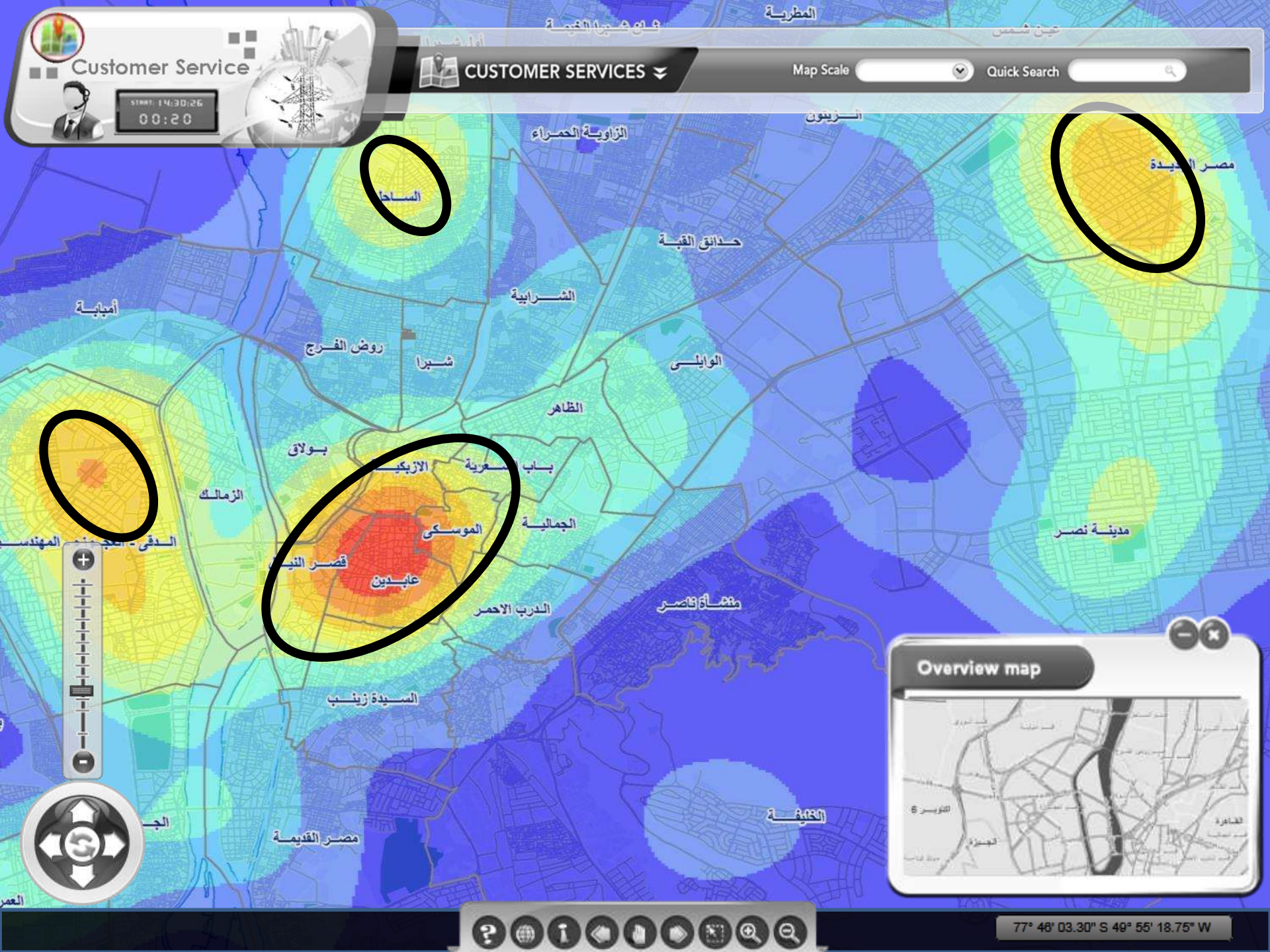

Customer Service
00:20
CUSTOMER SERVICES
Map Scale
Quick Search
Locate customer
Generate trouble tickets
Query & search
Customer Reply
Customer Information
Phone number
0384783666
Owner's full name
Mohamed Ahmed
Contact information
Contact information
Contact phone number
0387436739
Mobile number
0103762368809
Address
454 Al ahram Al Giza
Connection Details
Service Information
Overview map
Khaled Ibn Al Walid
Al Tahrir
Al Amr
77° 46' 03.30" S 49° 55' 18.75" W


Customer Service
00:20
CUSTOMER SERVICES
Map Scale
Quick Search
Locate customer
Generate trouble tickets
Query & search
Customer Reply
Customer Information
Phone number
0384783666
Owner's full name
Mohamed Ahmed
Contact information
Contact information
Contact phone number
0387436739
Mobile number
0103762368809
Address
454 Al ahram Al Giza
Connection Details
Service Information
Generate Trouble Ticket
Problem Type :
Pipe leakage
Comment :
Pipe Leakage
GENERATE
CANCEL
Overview map
Water Lifting Station
Al Tahrir
Al Amr
Zakariya
77° 46' 03.30" S 49° 55' 18.75" W


Customer Service
00:20
CUSTOMER SERVICES
Map Scale
Quick Search
Locate customer
Generate trouble tickets
Query & search
Customer Reply
Generate Trouble Ticket
Problem Type :
Sewer Overflow
Comment :
GENERATE
CANCEL
Answer Script
Maintenance is currently in progress expected 2hrs to return back
Overview map
Service Request
Khaled Ibn Al Walid
Al Amrikey
Al Tahrir
Mohammed Al Mougi
77° 46' 03.30" S 49° 55' 18.75" W

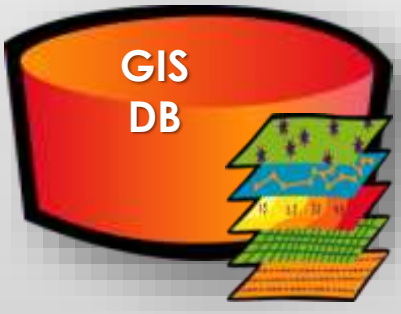


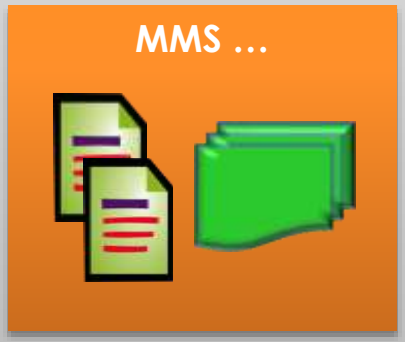
Customer Service
START: 14:30:26
00:20
CUSTOMER SERVICES
Map Scale
Quick Search
Severe (0)
Today Closed Cases
High (17)
Cases %
58
20
0
17
Medium (58)
Low (20)
Severe
High
Normal
Low
All
Severe
High
Medium
Low
40
20
0
26
7
16
36
7
Statisti
Service Request
77° 46' 03.30" S 49° 55' 18.75" W
Abu Bakr Al Sadiq
Ismail Pasha Al Falaki
Abaza
Al Sahtawi
Kamal Raslan
Al Tagneid Bridge
Mohammed Shokri
Nehro
Al Salam
Al Dair Al Bat


Customer Service
00:20
CUSTOMER SERVICES
Map Scale
Quick Search
المطرية
الزاوية الحمراء
الساحل
حدائق القبة
الشرابية
أمبابة
روض الفرج
شبرا
الوايلي
الظاهر
بولاق
الازبكية
باب الشعرية
الزمالك
الجمالية
الموسكى
قصر النيل
عابدين
الدرب الاحمر
منشأة ناصر
مدينة نصر
السيدة زينب
مصر القديمة
الخليفة
Overview map

Maintenance Management

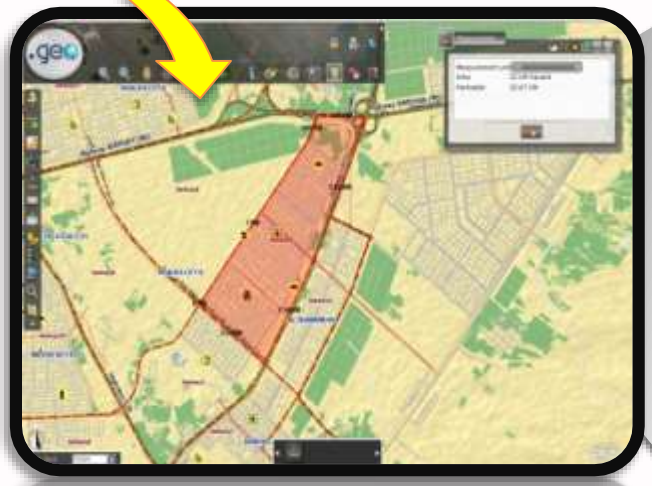
DATA





Data

Maintenance Management Module



Aim:
Managing maintenance process for water assets and provide workforce with maintenance map…etc.

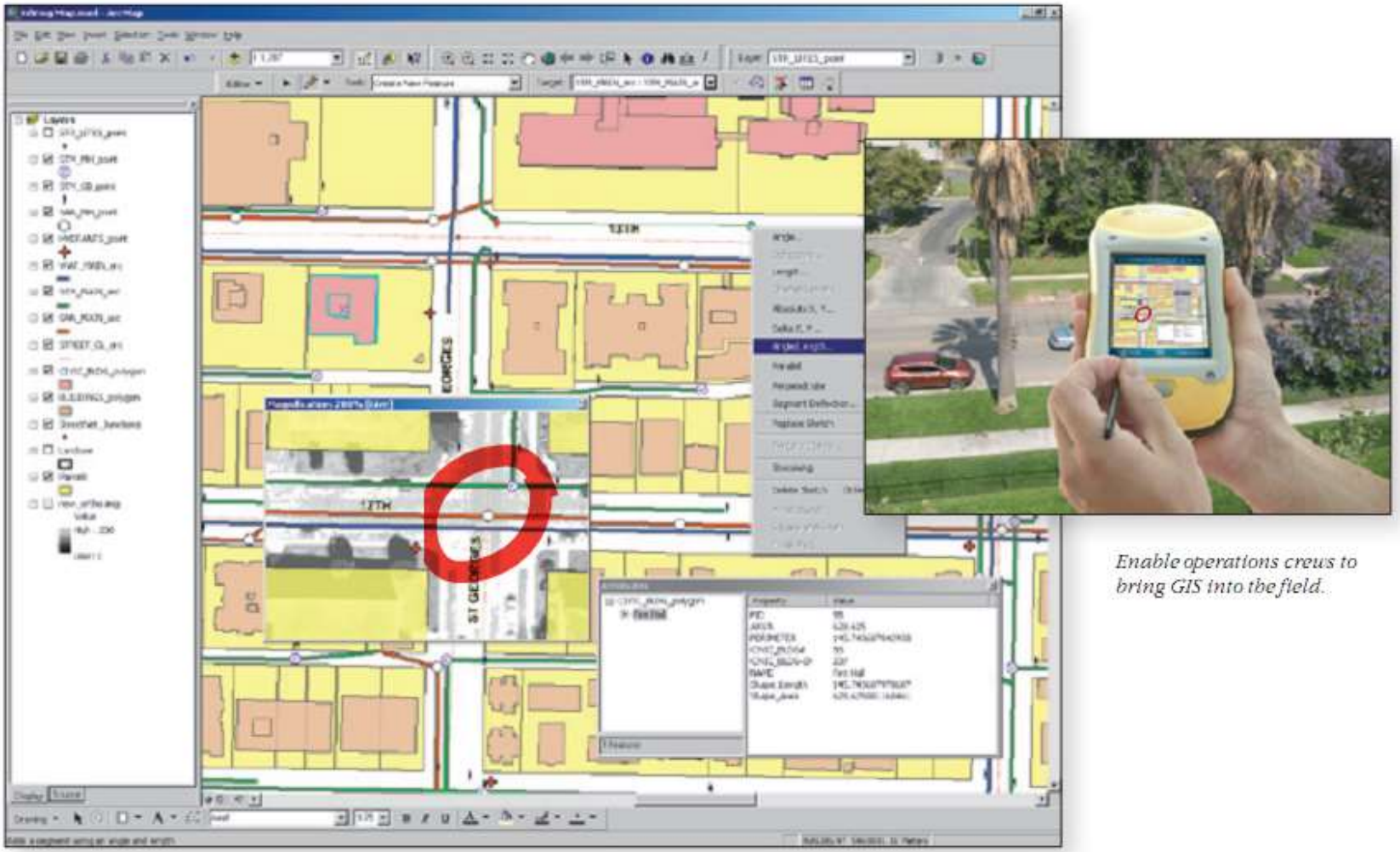
Main Functions

- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Map Classification
- Show Assets
- Editing
- Maintenance Status Map
- Tracing
- Schedule Maintenance Plan
- Assign to workforce
- Plotting

How Long does it Take to get Information Into and Out of the Field?

It ‘s Difficult to Effectively Communicate with Field Operations

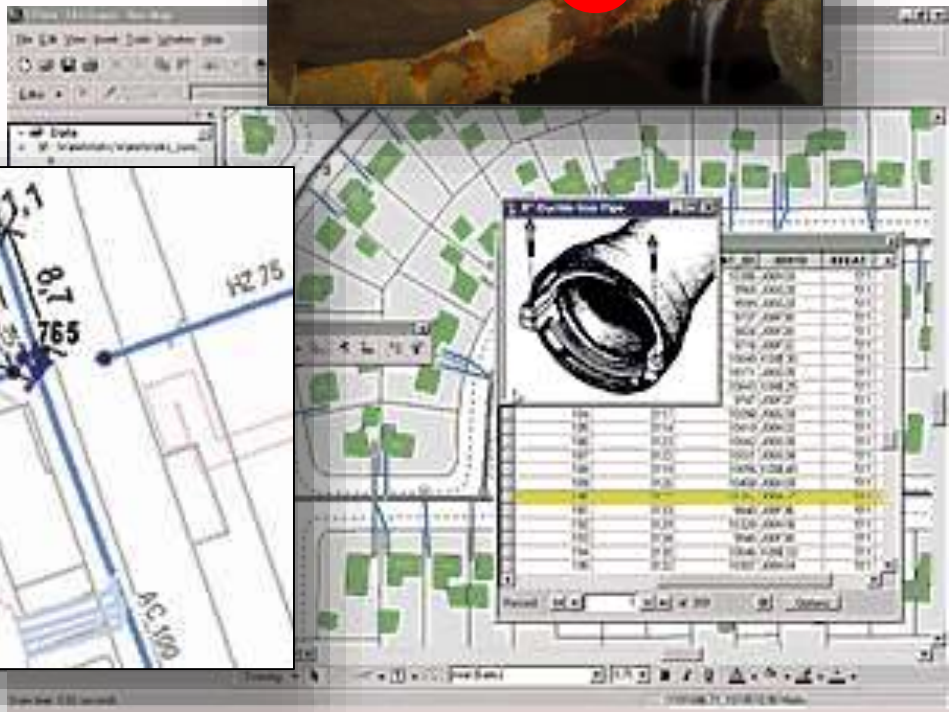
Supporting Field Crew

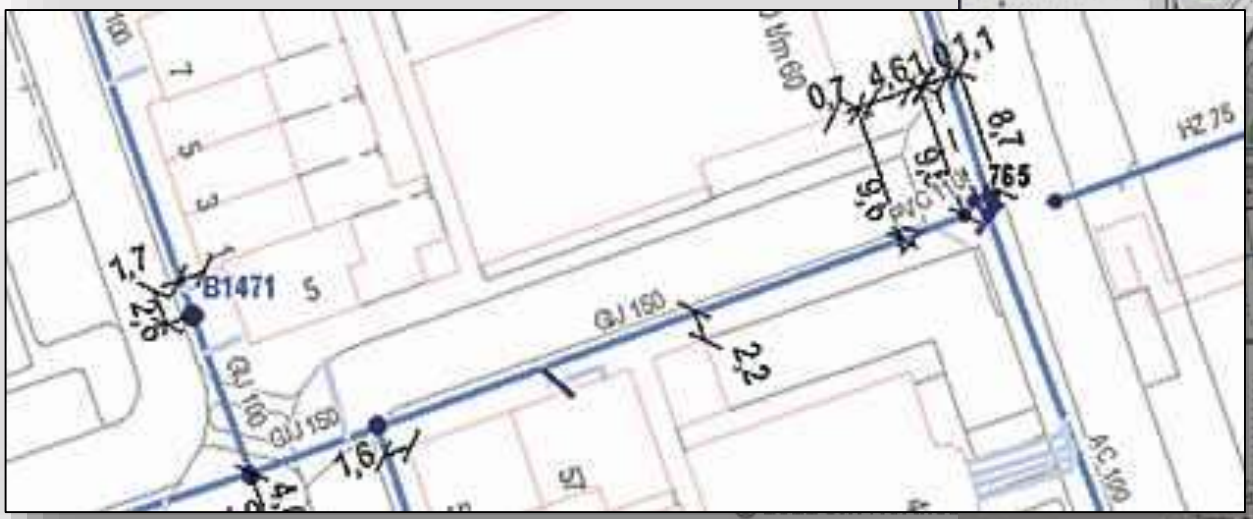


Enable operations crews to bring GIS into the field.

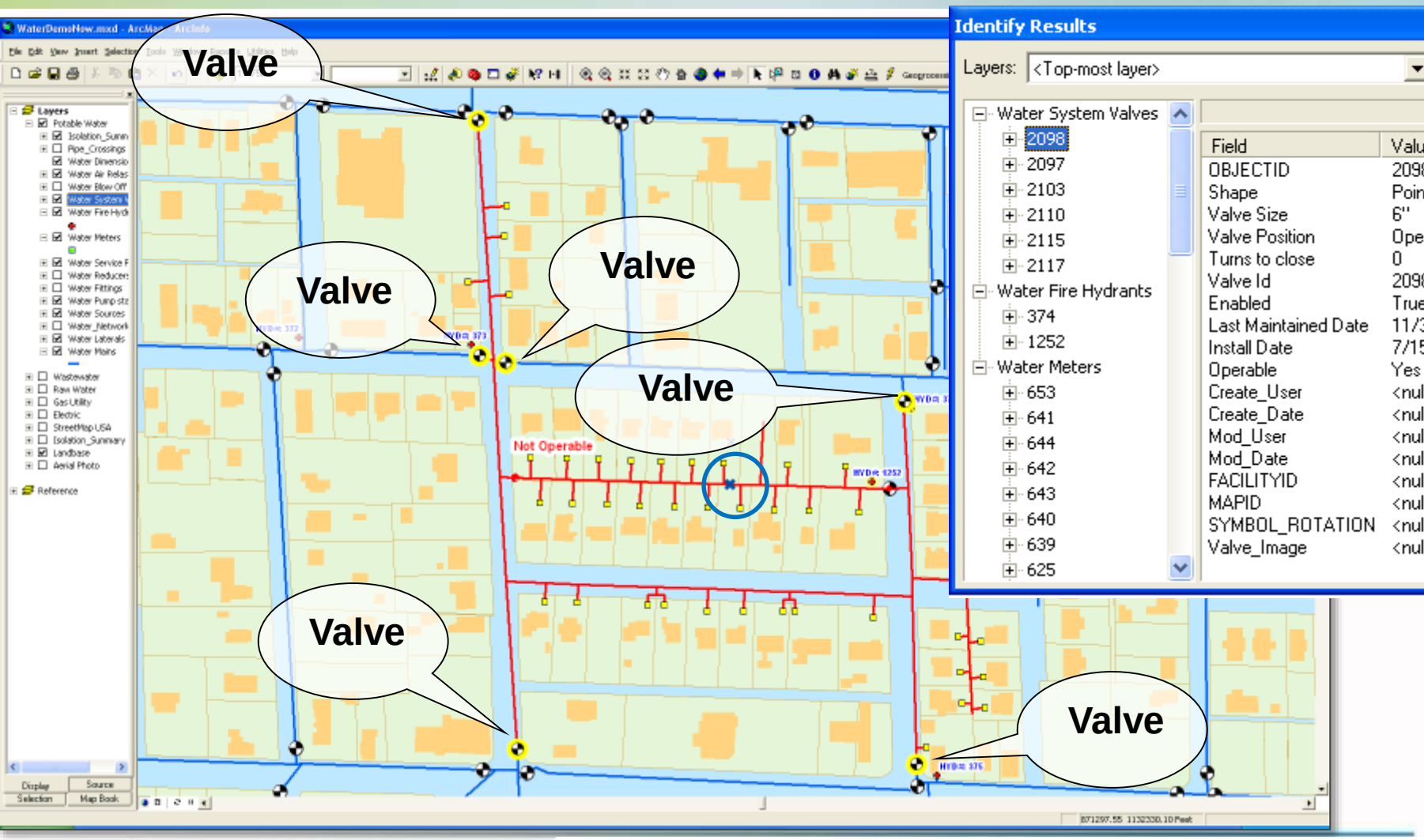
Easy Access to Information, Anywhere

- Find & locate reported pipes
- Identify working area (land-use, street width…)
- Retrieve the diameters & types of pipes
- Locate valves that should be closed
- Find alternative paths during failures

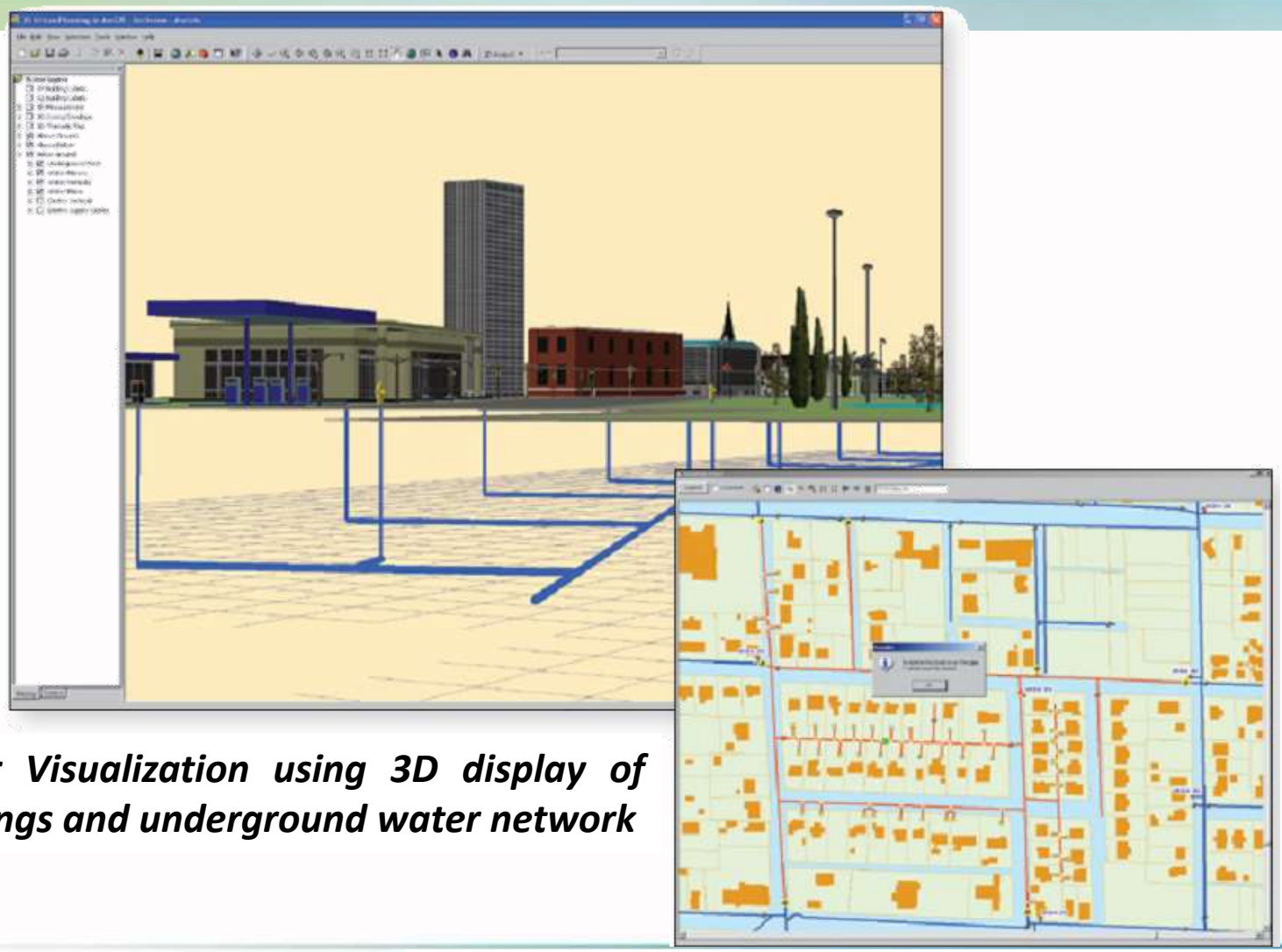




Taking actions to handle failures

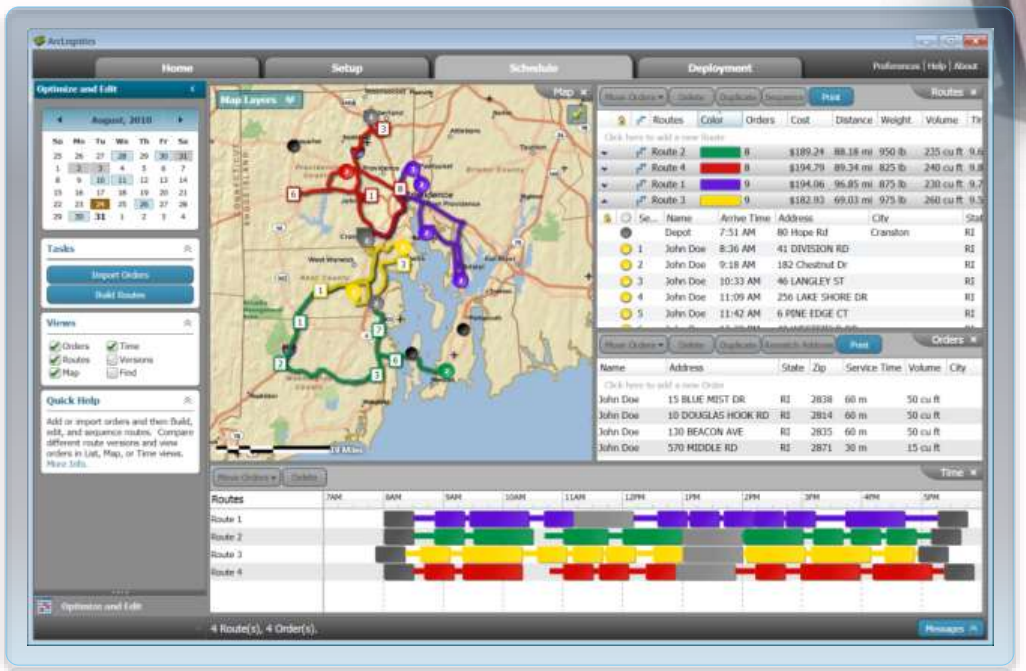


Powerful Visualization

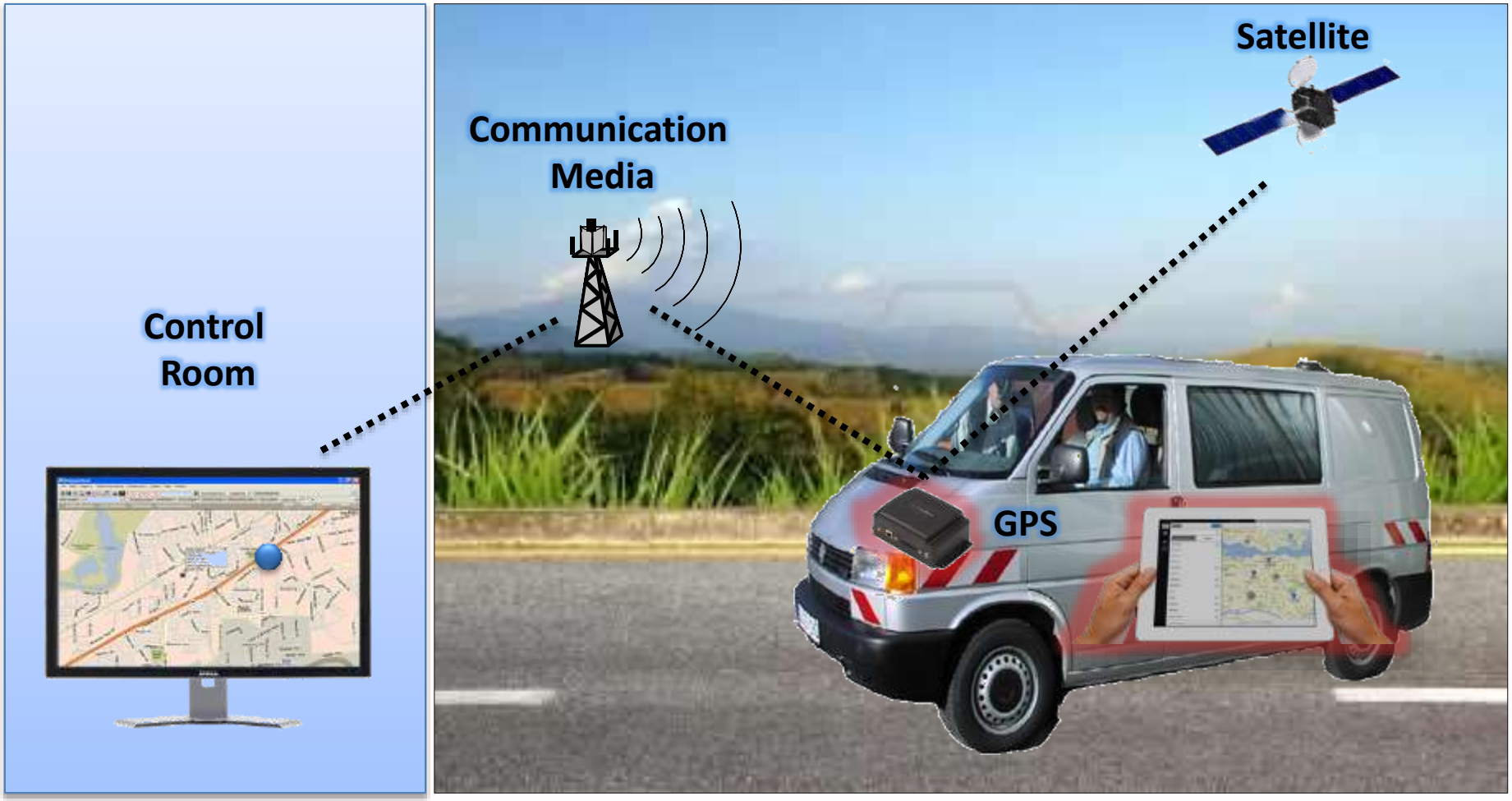


Better Visualization using 3D display of Buildings and underground water network

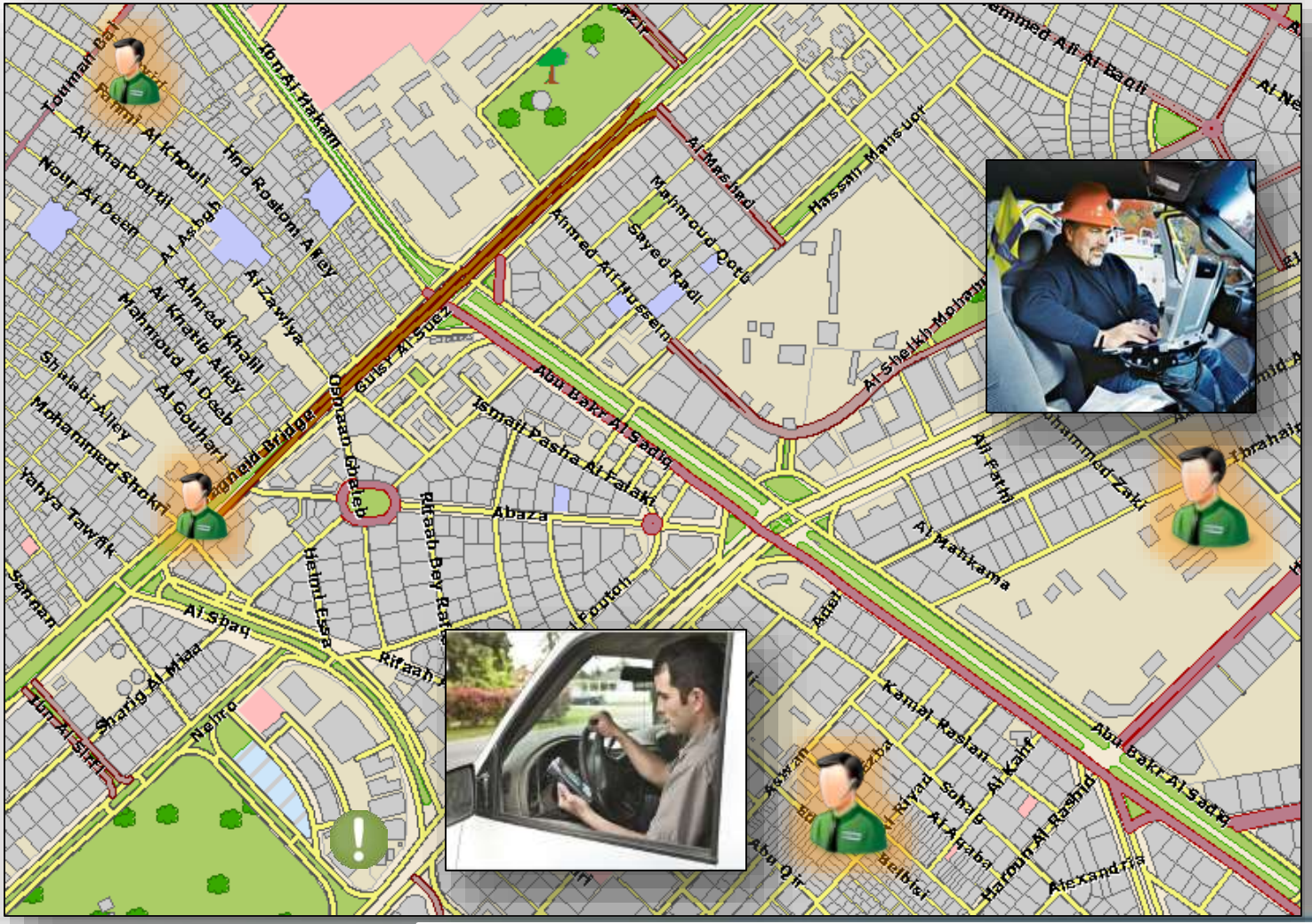
Workforce Optimization



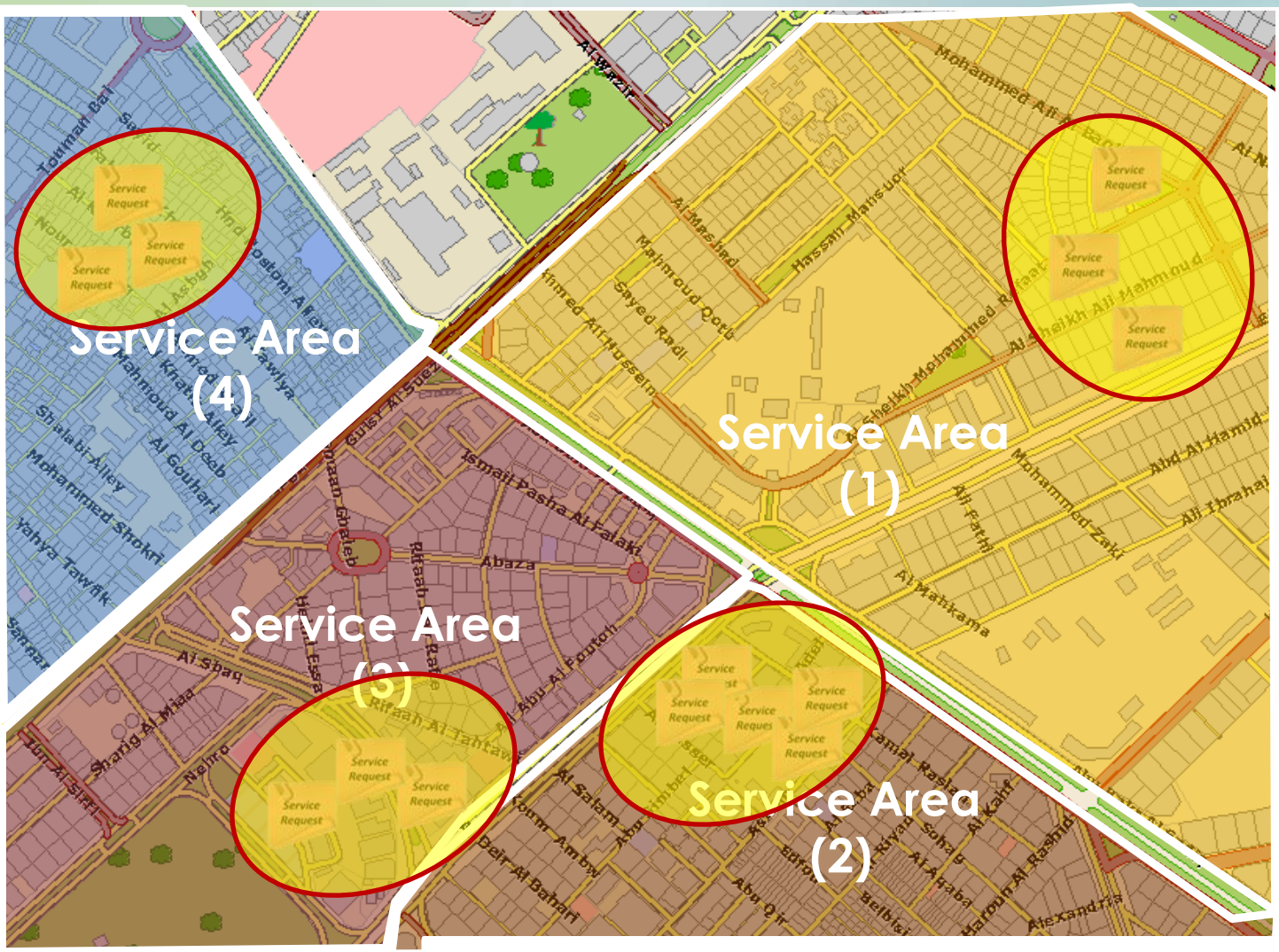
Tracking in-Field Teams



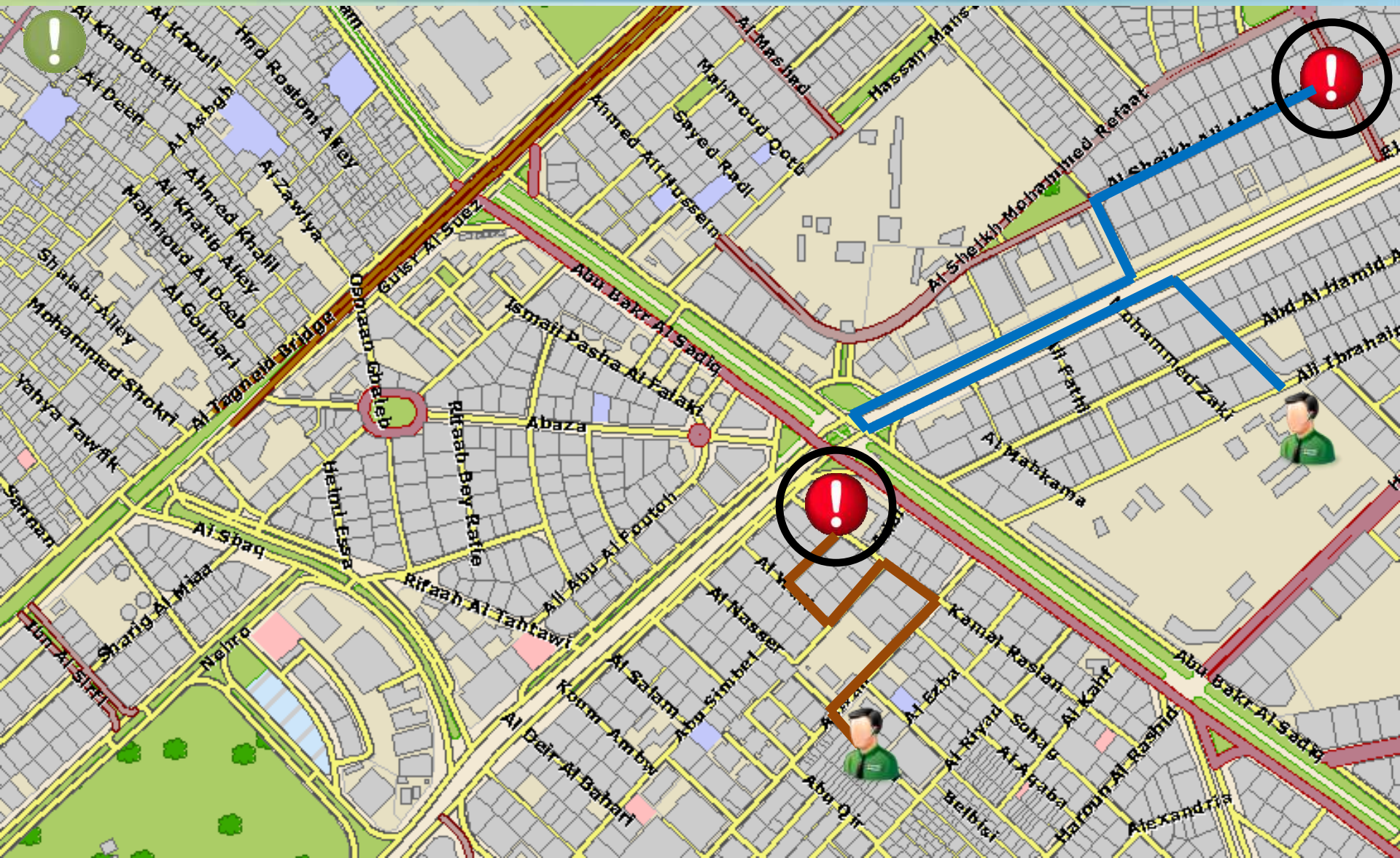
Tracking in-Field Teams



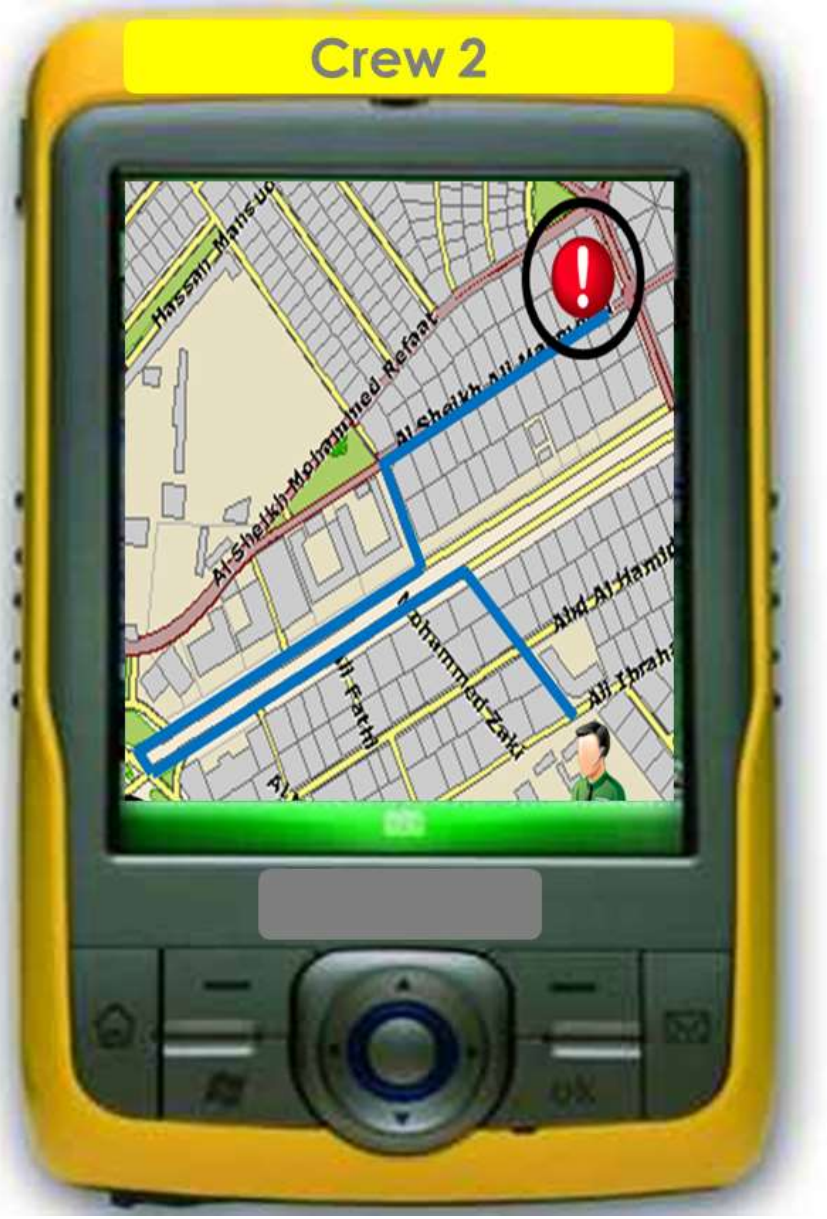
Locations of Service Requests

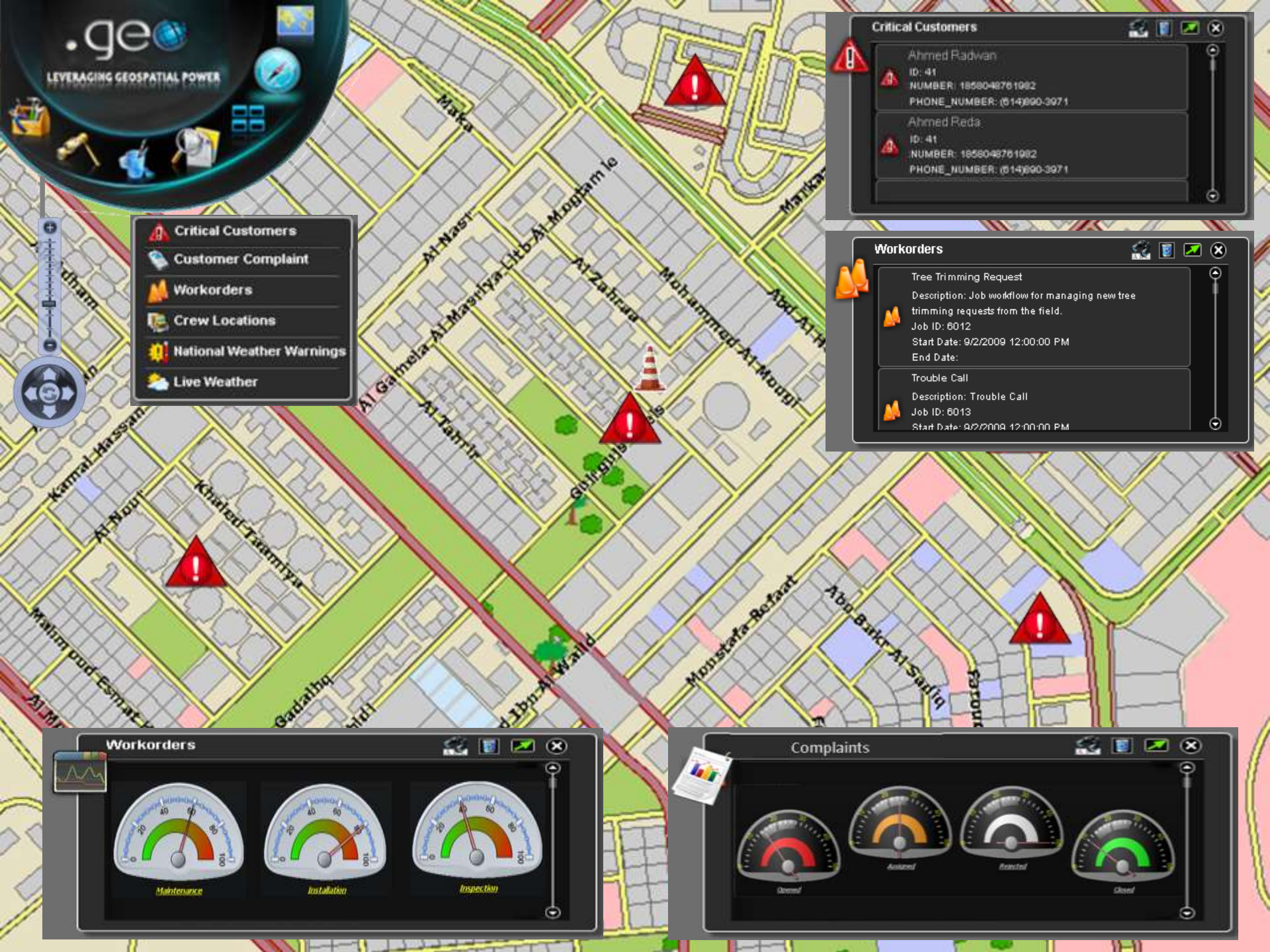


Assign Service Requests

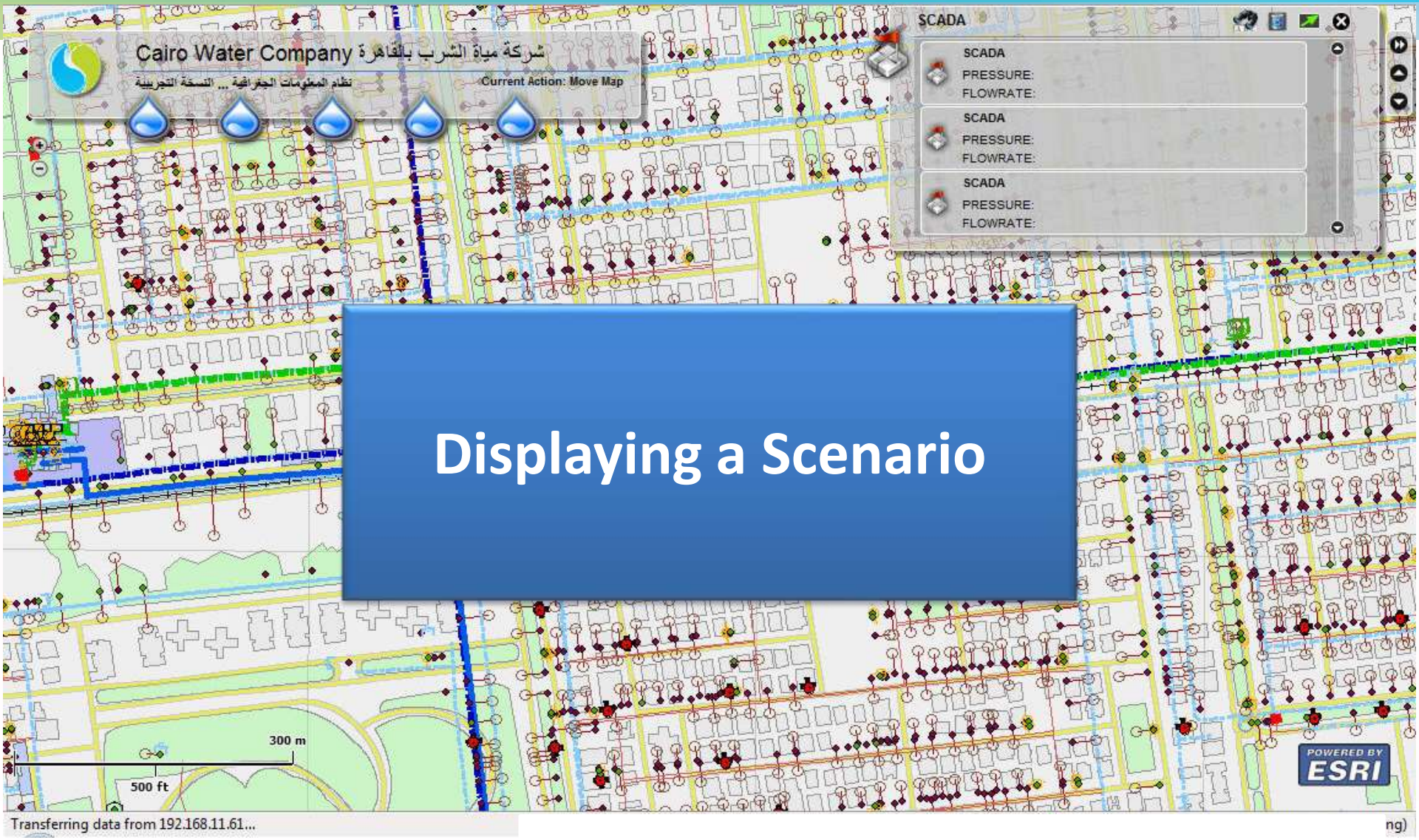



Crew 1
Kamal Ras
Al-Ezba
Al-Riyad

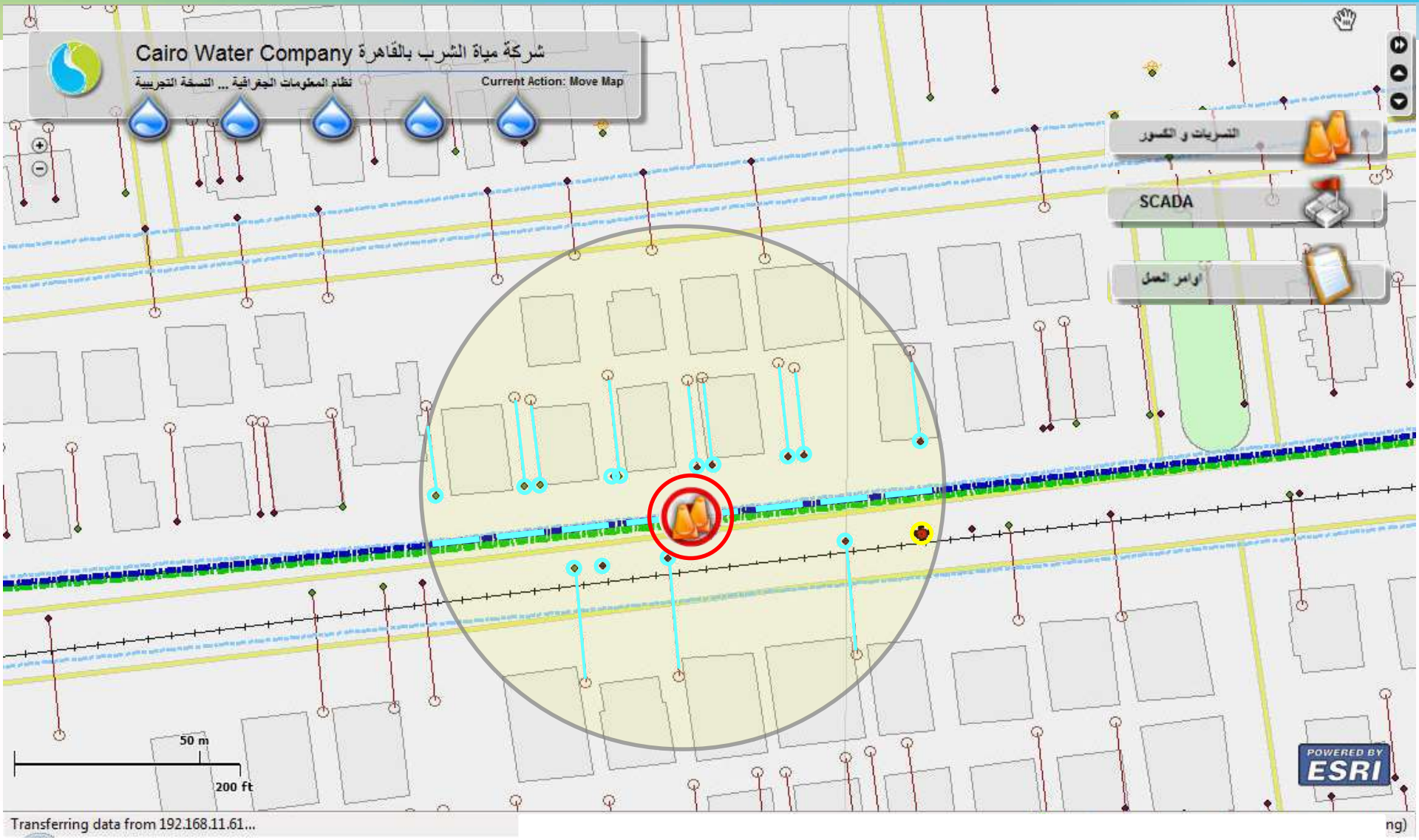

Crew 2
Hassan Mans
Al-Sheikh-Mohammed-Refaat
Al-Sheikh-Al
Mohammed-Zaki
Abd-Al-Hamid


.geo
LEVERAGING GEOSPATIAL POWER
Critical Customers
Customer Complaint
Workorders
Crew Locations
National Weather Warnings
Live Weather
Critical Customers
Ahmed Radwan
ID: 41
NUMBER: 1858048761982
PHONE_NUMBER: (614)890-3971
Ahmed Reda
ID: 41
NUMBER: 1858048761982
PHONE_NUMBER: (614)890-3971
Workorders
Tree Trimming Request
Description: Job workflow for managing new tree trimming requests from the field.
Job ID: 6012
Start Date: 9/2/2009 12:00:00 PM
End Date:
Trouble Call
Description: Trouble Call
Job ID: 6013
Workorders
Maintenance
Installation
Inspection
Complaints
Opened
Assigned
Rejected
Closed
Maka
Al-Nasr
Al Gamela Al-Masriya Ltb Al-Mogtam Ie
Al Zahraa
Mohammed Al-Mougi
Abd-Al-H
Al Tahrir
Kamal Hassan
Al Nour
Khaled Taamiya
Gardaibq
Ibn Al Walid
Moustafa Refaat
Abo Bakr Al Sadiq

Receiving Alert



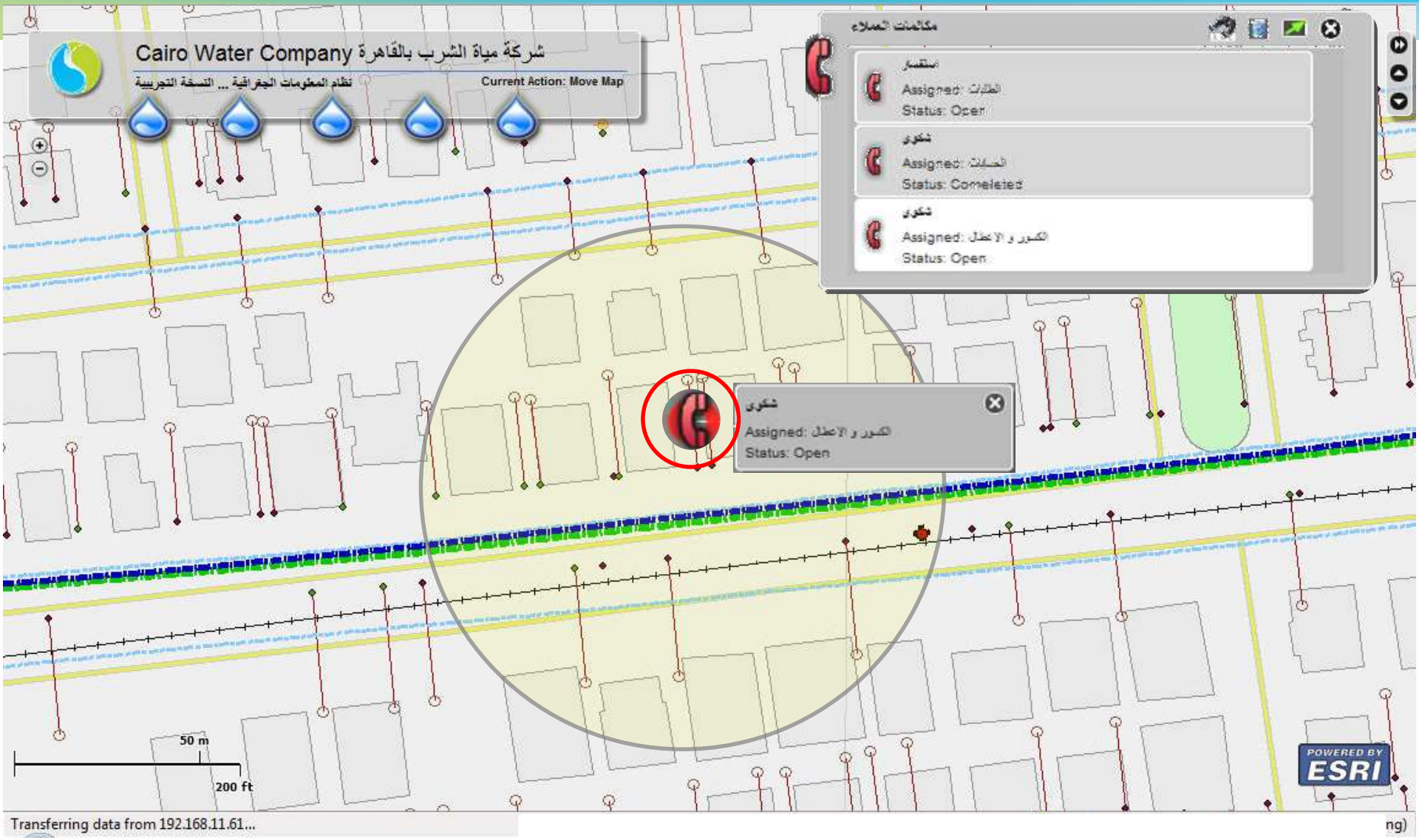
Analyzing Situation



Sending information to in-Field team

Sending update from field

Information are available to customer Service



Water Quality

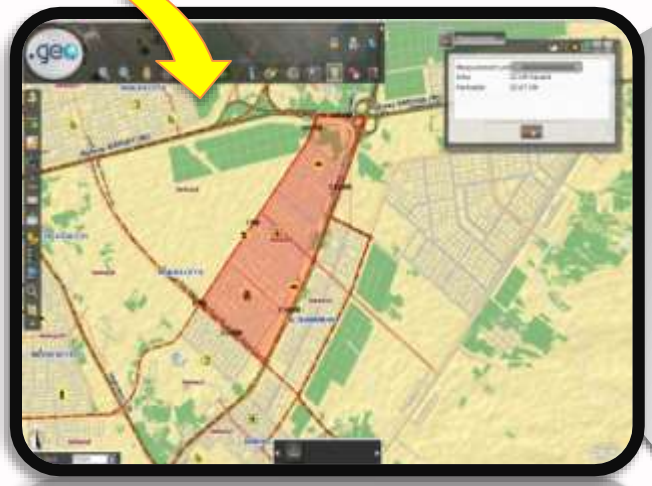
Water Quality

DATA

Data

GIS DB

MMS …



Aim:
Support the process of water quality verifications by providing maps for the samples locations and several analysis tools

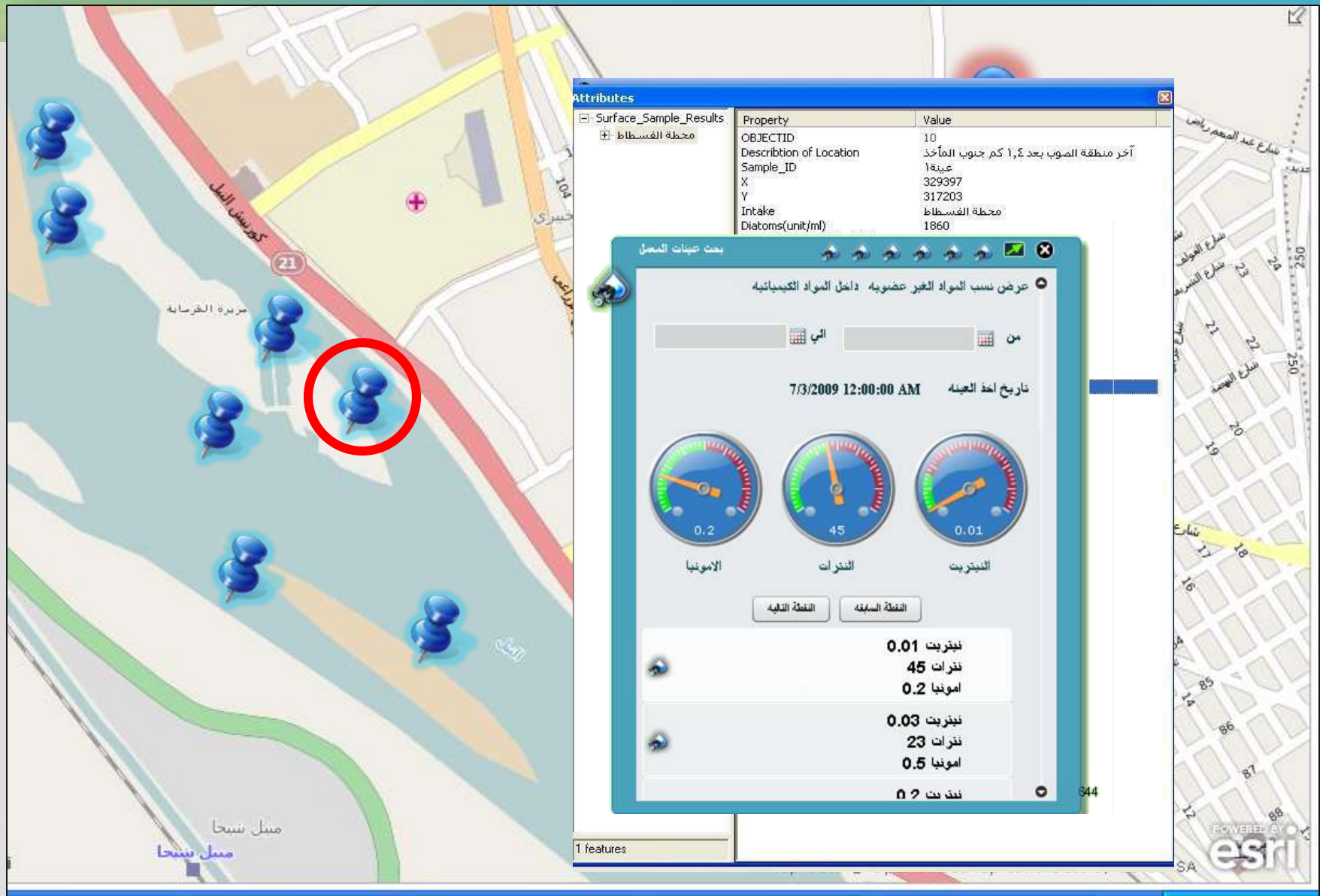
Main Functions

- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Map Classification
- Show Assets
- Editing
- Charts
- History
- Samples Locations
- Schedules
- Plotting

GIS for Water Quality

- Using coordinates from GPS, Samples can be re-collected from same locations
- Follow current & historical Results of samples
- Analyses & Reports

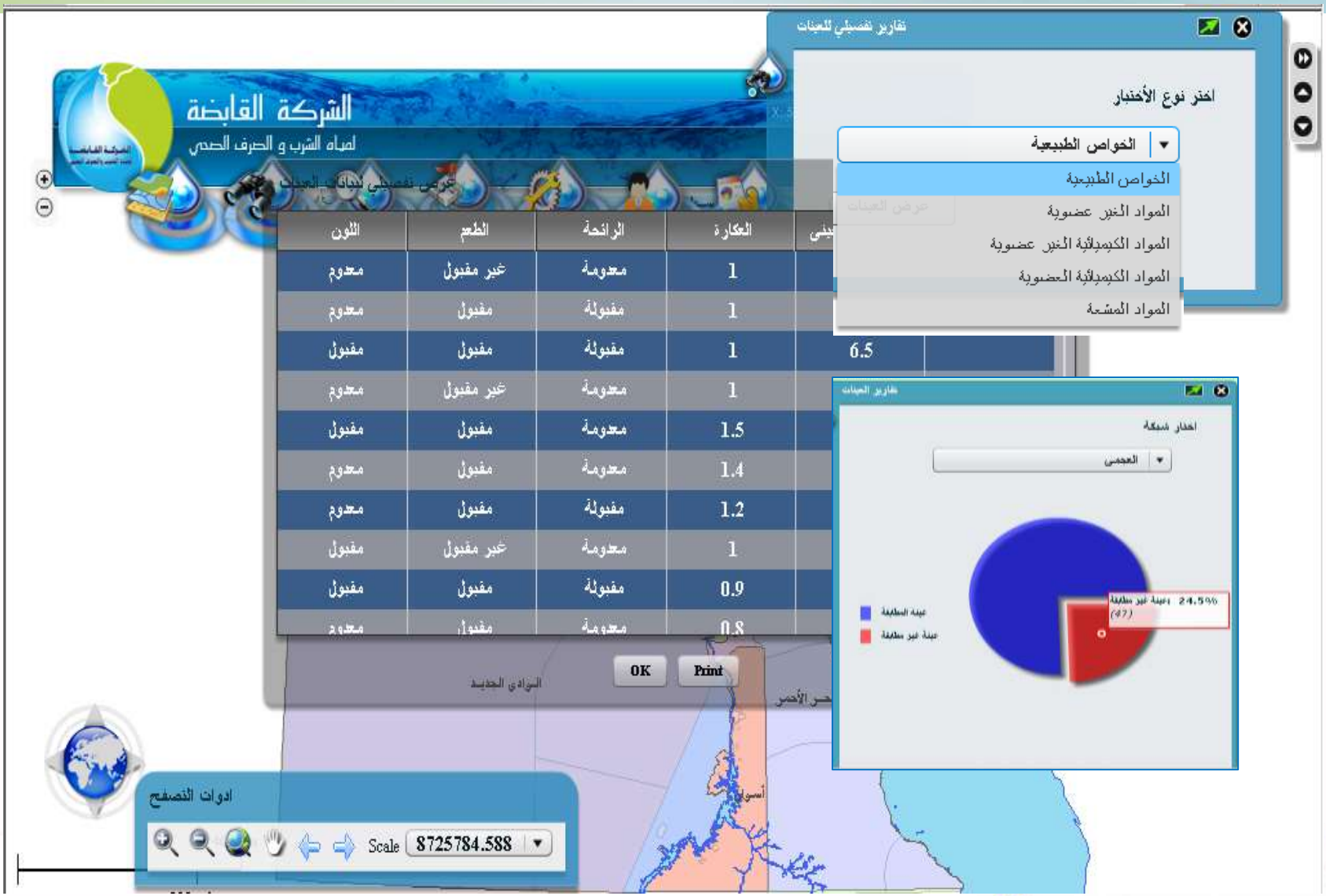
Locations of Water Samples



Details of the sample

Compliant & non compliant samples

Reports about Samples



Network Planning

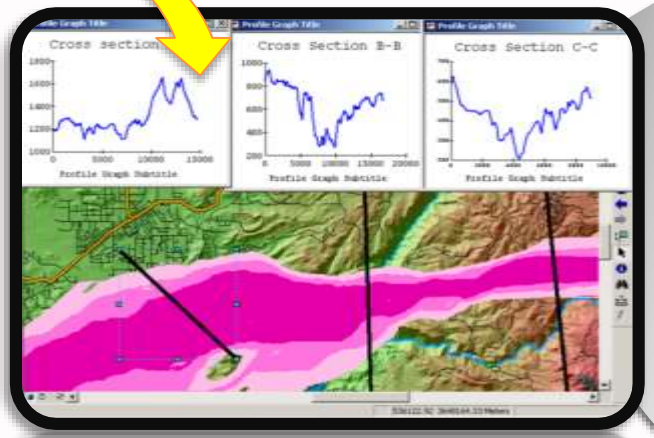
DATA

GIS DB

Other Data

Data

Network Planning Module

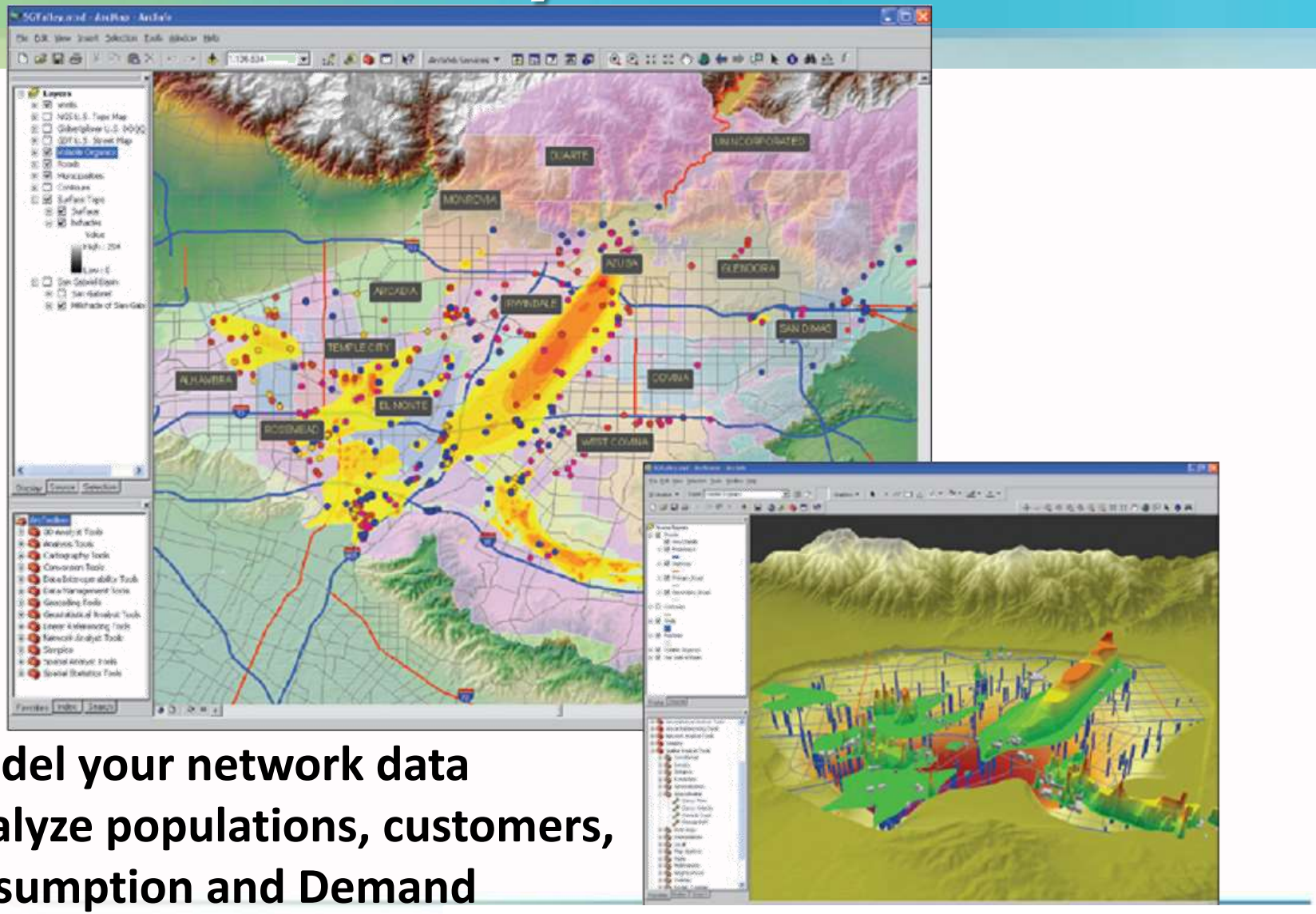


Aim:
allows planners with multiple tools to assess and weigh scenarios that balance levels of investment against asset life span.

Main Functions

- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Map Classification
- Least Cost Path
- Obstacles along route
- Regulations
- Topography
- Land-use

Analyze & Plan



- Model your network data
- Analyze populations, customers, Consumption and Demand

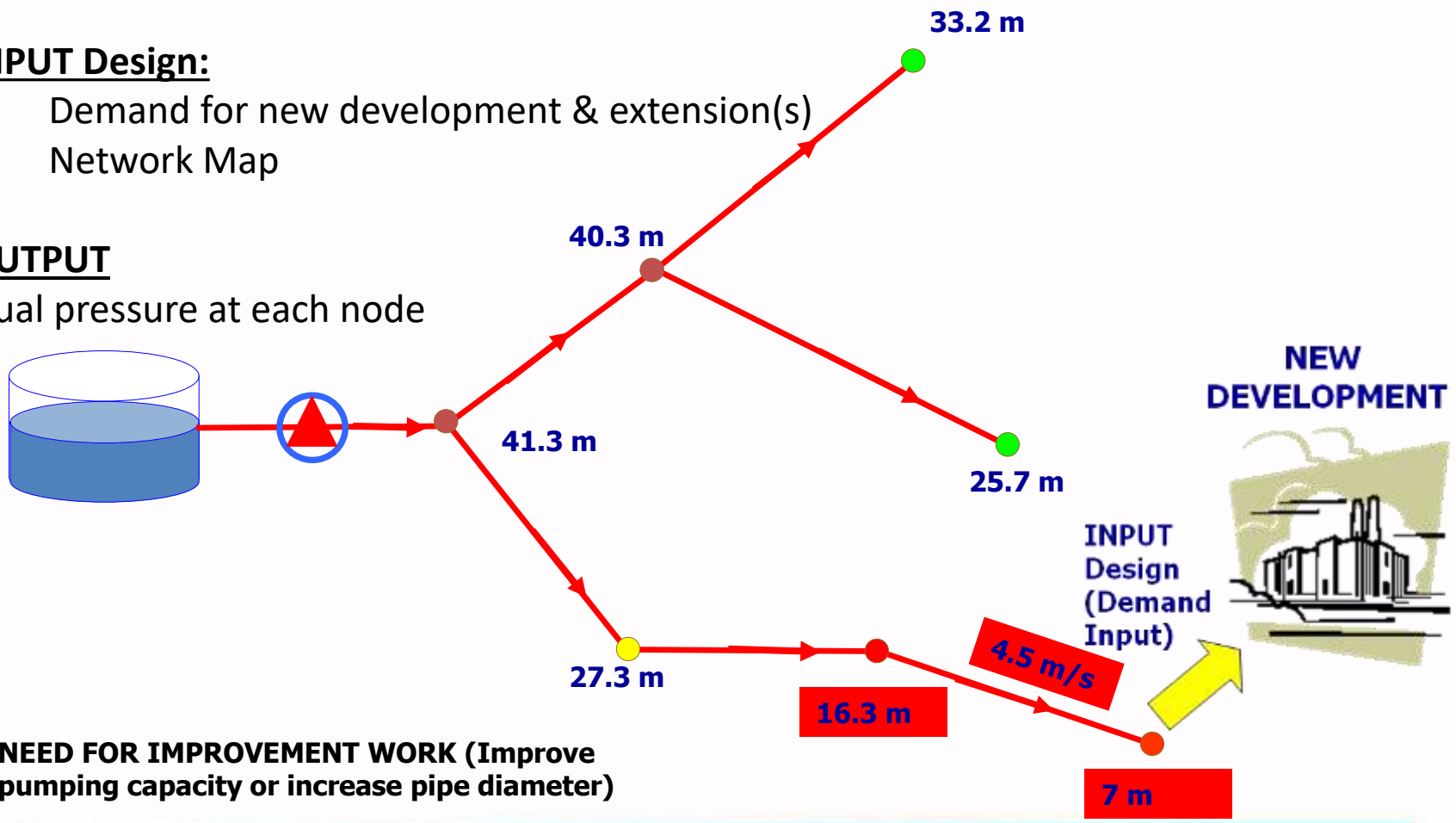
Planning for new developments

Model Approach: 1

- **INPUT Design:**
  - Demand for new development & extension(s)
  - Network Map

- **OUTPUT**

Residual pressure at each node



Planning for new developments

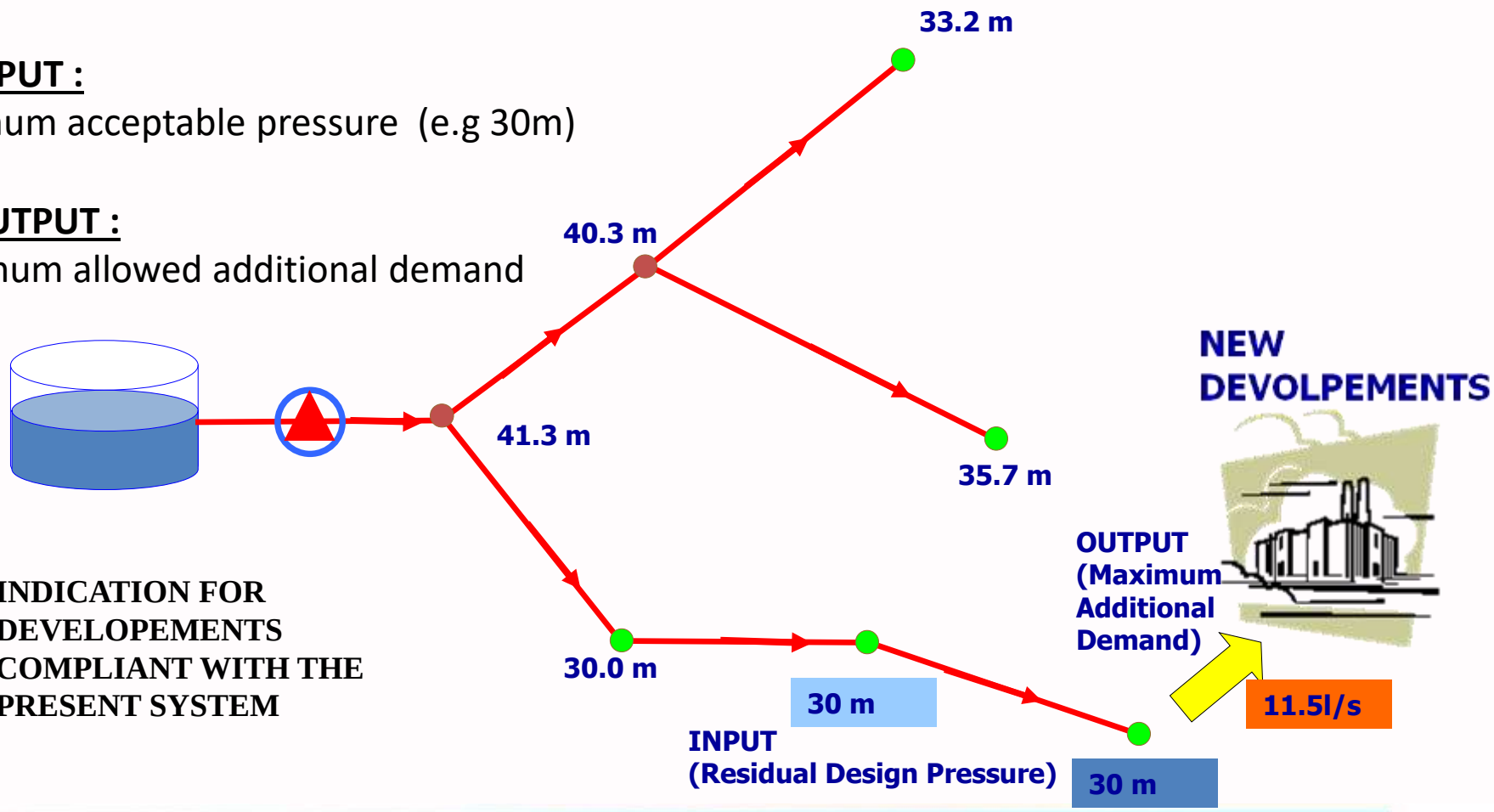
Model Approach: 2

- **INPUT :**

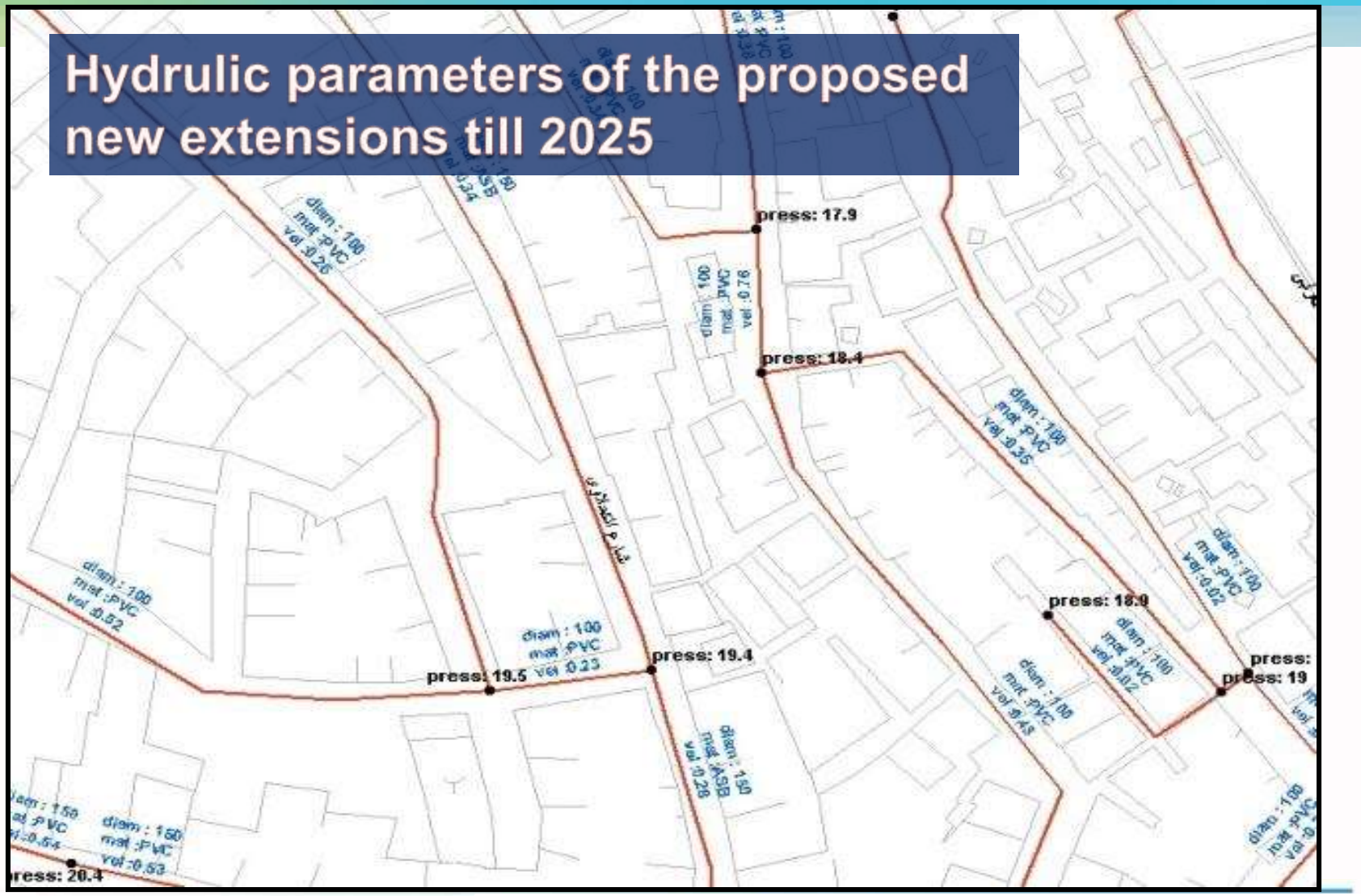
Minimum acceptable pressure (e.g 30m)

- **OUTPUT :**

Maximum allowed additional demand



Model the future



W-GIS (Projects Tracking)

DATA

W-GIS DB

Project Server

Data

WGIS Projects Tracking Module

Aim:
provides access to Water projects information and provides tools to support project planning, management, and data acccess…etc.

Main Functions

- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Map Classification
- Project Browser
- Project Analyzer
- Project Finder
- Project Tracking
- Reporting
- Redlining
- Plotting

Status: ACTIVE

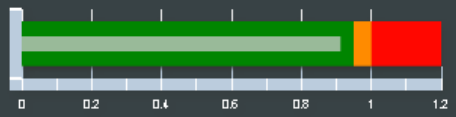
Subworktype:

Apply Filter | Clear Filter | Select From Map

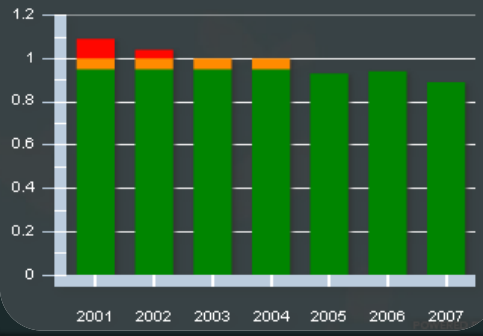
Attributes of Filtered Features 3 features

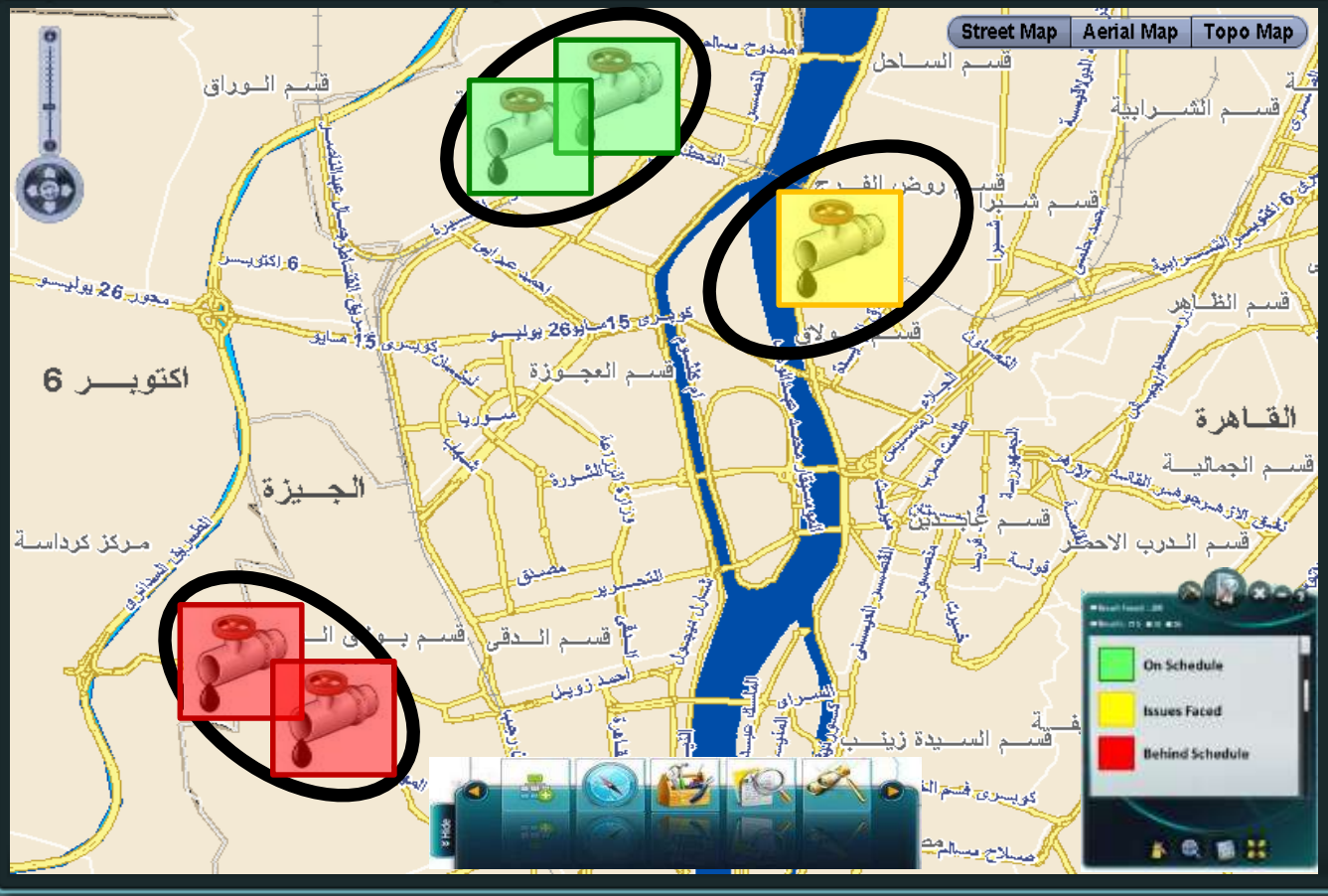
Status	Subworktype	Construction Cost
ACTIVE		17522000
ACTIVE		878000
ACTIVE		878000

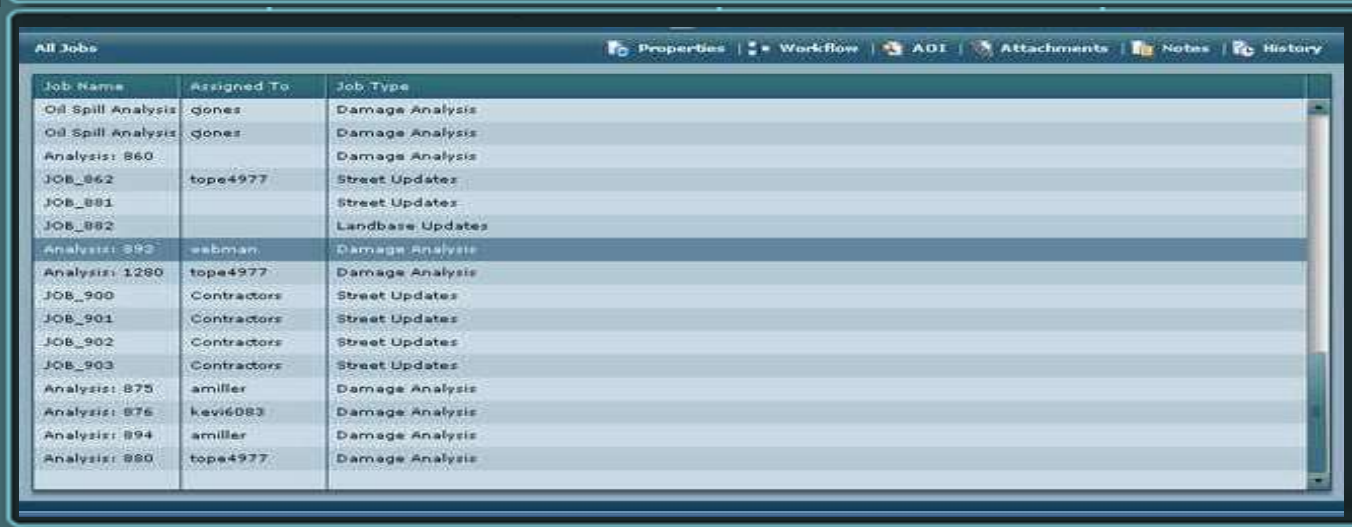
CURRENT



HISTORIC







Job Name	Assigned To	Job Type
Oil Spill Analysis	gones	Damage Analysis
Oil Spill Analysis	gones	Damage Analysis
Analysis: 860		Damage Analysis
JOB_862	tope4977	Street Updates
JOB_881		Street Updates
JOB_882		Landbase Updates
Analysis: 892	webman	Damage Analysis
Analysis: 1280	tope4977	Damage Analysis
JOB_900	Contractors	Street Updates
JOB_901	Contractors	Street Updates
JOB_902	Contractors	Street Updates
JOB_903	Contractors	Street Updates
Analysis: 875	amiller	Damage Analysis
Analysis: 876	kevi6083	Damage Analysis
Analysis: 894	amiller	Damage Analysis
Analysis: 880	tope4977	Damage Analysis

Status: ACTIVE

Subworktype:

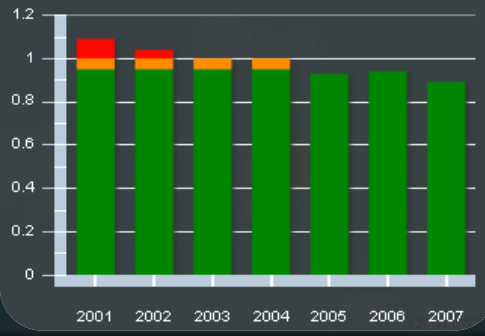
Apply Filter | Clear Filter | Select From Map

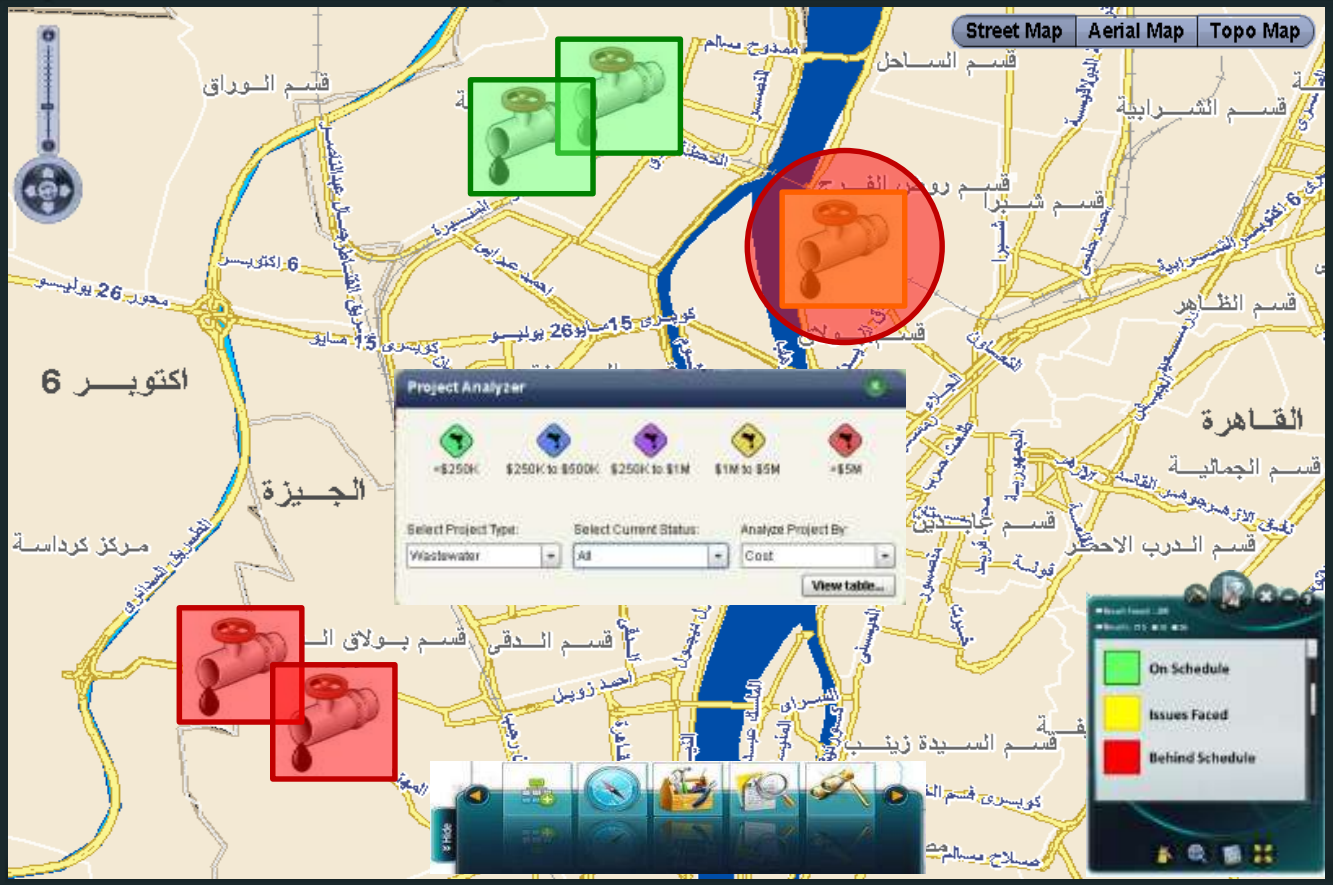
Attributes of Filtered Features 3 features

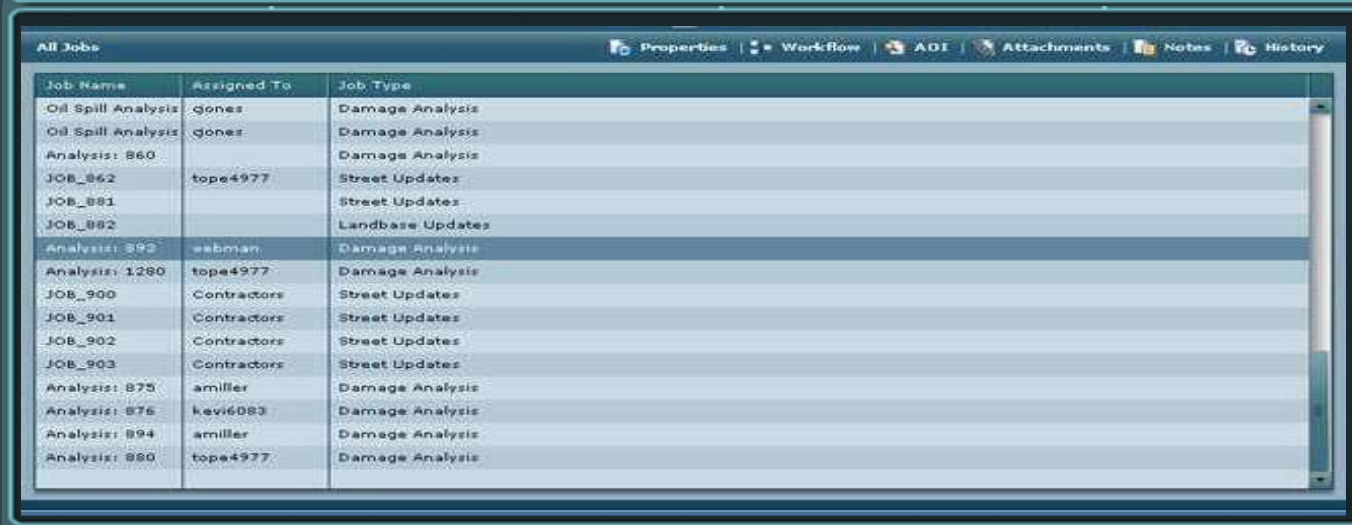
Status	Subworktype	Construction Cost
ACTIVE		17522000
ACTIVE		878000
ACTIVE		878000

CURRENT

HISTORIC





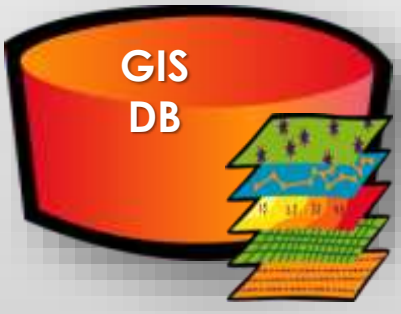


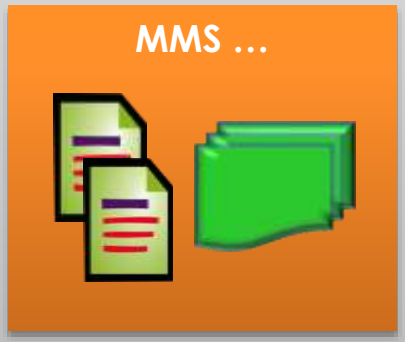

.geo
LEVERAGING GEOSPATIAL POWER
Status
ACTIVE
Subworktype
Apply Filter
Clear Filter
Select From Map
Attributes of Filtered Features 3 features
Status
Subworktype
Construction Cost
ACTIVE
17522000
ACTIVE
878000
ACTIVE
878000
CURRENT
HISTORIC
2001
2002
2003
2004
2005
2006
2007
Street Map
Aerial Map
Topo Map
Enter Comment:
Add
Date
User Activity Type
Message
11/13/2007 10:01
kellymCreateJob
Job created by Kelly Malone.
11/13/2007 10:37
kellymAddAttachment
Attachment C:\UC2007\CadastralDemo\LiveDemoResources\CASE NO 1512.doc added by Kelly Malone. As Link
11/13/2007 10:37
kellymDeleteAttachment
Attachment C:\UC2007\CadastralDemo\LiveDemoResources\CASE NO 1512.doc deleted by Kelly Malone.
11/13/2007 10:37
kellymAddAttachment
Attachment CASE NO 1512.doc added by Kelly Malone. In DB
11/13/2007 10:38
kellymAddAttachment
Attachment C:\Temp\ProjectData\photo_parcel_Aug2907.bmp added by Kelly Malone. As Link
11/13/2007 10:40
kellymUpdateAOI
Job AOI updated by Kelly Malone.
11/14/2007 09:40
kellymUpdateExProperties
Extended properties updated by Kelly Malone.
11/14/2007 09:50
kellymStepCompleted
Step Gather Info from Lot Split Applicaiton (708) marked as done by Kelly Malone.
11/14/2007 09:50
kellymStepSet
Step 708 set as the current step by Kelly Malone.
11/14/2007 10:03
kellymStepCompleted
Step Gather Info from Lot Split Applicaiton (708) marked as done by Kelly Malone.
File to attach:
Browse...
Upload
*Maximum upload file size is 2 MB
CASE NO 1512.doc
[Download] [Delete]
photo_parcel_Aug2907.bmp
[Download] [Delete]
QC_Log.txt
[Download] [Delete]
All Jobs
History
Job Name
Analysis: 892
webman
Damage Analysis
Analysis: 1280
tope4977
Damage Analysis
JOB_900
Contractors
Street Updates
JOB_901
Contractors
Street Updates
JOB_902
Contractors
Street Updates
JOB_903
Contractors
Street Updates
Analysis: 875
amiller
Damage Analysis
Analysis: 876
kevi6083
Damage Analysis
Analysis: 894
amiller
Damage Analysis
Analysis: 880
tope4977
Damage Analysis


.geo
LEVERAGING GEOSPATIAL POWER
Status
ACTIVE
Subworktype
Apply Filter
Clear Filter
Select From Map
Attributes of Filtered Features 3 features
Status
Subworktype
Construction Cost
ACTIVE
17522000
ACTIVE
878000
ACTIVE
878000
CURRENT
HISTORIC
Street Map
Aerial Map
Topo Map
Enter Comment:
Add
Date
User Activity Type
Message
11/13/2007 10:01
kellymCreateJob
Job created by Kelly Malone.
11/13/2007 10:37
kellymAddAttachment
Attachment C:\UC2007\CadastralDemo\LiveDemoResources\CASE NO 1512.doc added by Kelly Malone. As Link
11/13/2007 10:37
kellymDeleteAttachment
Attachment C:\UC2007\CadastralDemo\LiveD 1512.doc deleted by Kelly Malone.
11/13/2007 10:37
kellymAddAttachment
Attachment CASE NO 1512.doc added by Kelly
11/13/2007 10:38
kellymAddAttachment
Attachment C:\Temp\ProjectData\photo_parcel Kelly Malone. As Link
11/13/2007 10:40
kellymUpdateAOI
Job AOI updated by Kelly Malone.
11/14/2007 09:40
kellymUpdateExProperties
Extended properties updated by Kelly Malone.
11/14/2007 09:50
kellymStepCompleted
Step Gather Info from Lot Split Applicaiton (70 Malone.
11/14/2007 09:50
kellymStepSet
Step 708 set as the current step by Kelly Malor
11/14/2007 10:03
kellymStepCompleted
Step Gather Info from Lot Split Application (70 Malone.
File to attach:
Browse...
*Maximum upload file size is 2 MB
CASE NO 1512.doc
[Download] [Delete]
photo_parcel_Aug2907.bmp
[Download] [Delete]
QC_Log.txt
[Download] [Delete]
Accountant
Place Holder
Administrator
Linda Cross
Harrison County Planning Commission
304-624-8690
Bond Counsel
Place Holder
Engineer
FERRELL, DANIEL (DAN)
Thrasher Engineering, Inc.
(304) 624-4108 x 1135
Local Counsel
Place Holder
PSC Counsel
Place Holder
Analysis: 892
webman
Damage Analysis
Analysis: 1280
tope4977
Damage Analysis
JOB_900
Contractors
Street Updates
JOB_901
Contractors
Street Updates
JOB_902
Contractors
Street Updates
JOB_903
Contractors
Street Updates
Analysis: 875
amiller
Damage Analysis
Analysis: 876
kevi6083
Damage Analysis
Analysis: 894
amiller
Damage Analysis
Analysis: 880
tope4977
Damage Analysis

Executive Dashboard

DATA





Dashboard

Data

Aim:
Support the process of water quality verifications by providing maps for the samples locations and several analysis tools

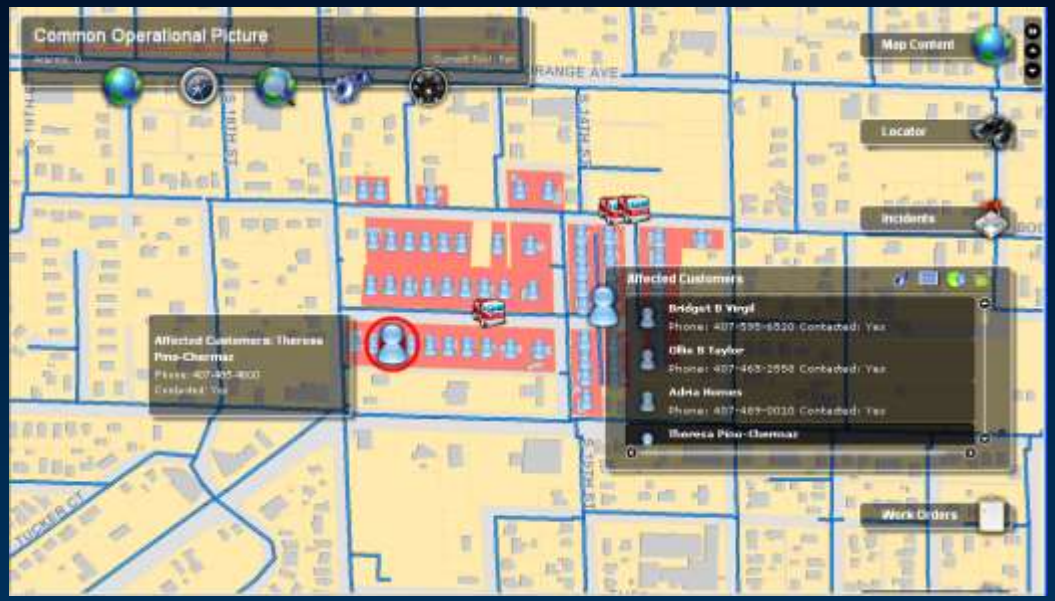
Main Functions

- Map Navigation
- Spatial Search
- Tabular Search
- Measurements
- Base Map
- Bookmarks
- Map Classification
- Show Assets
- Editing
- Charts
- History
- Performance Indicators
- Track Projects

GIS Provides Complete Operational Awareness

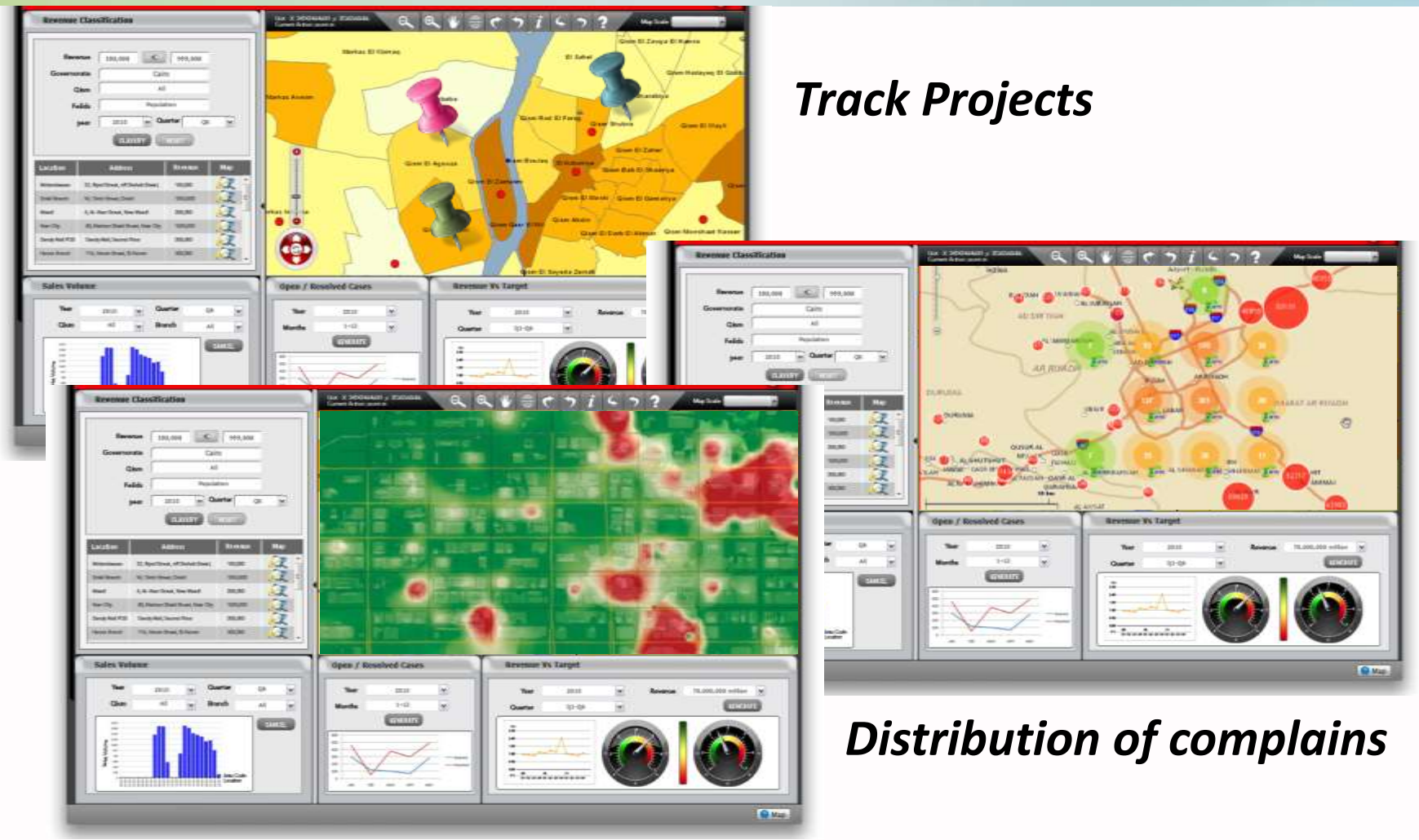
A Common Platform for Sharing Information

- Fully Aware
- More Accountable
- Better Managed



Giving You Visibility into Your Operations

Dashboard



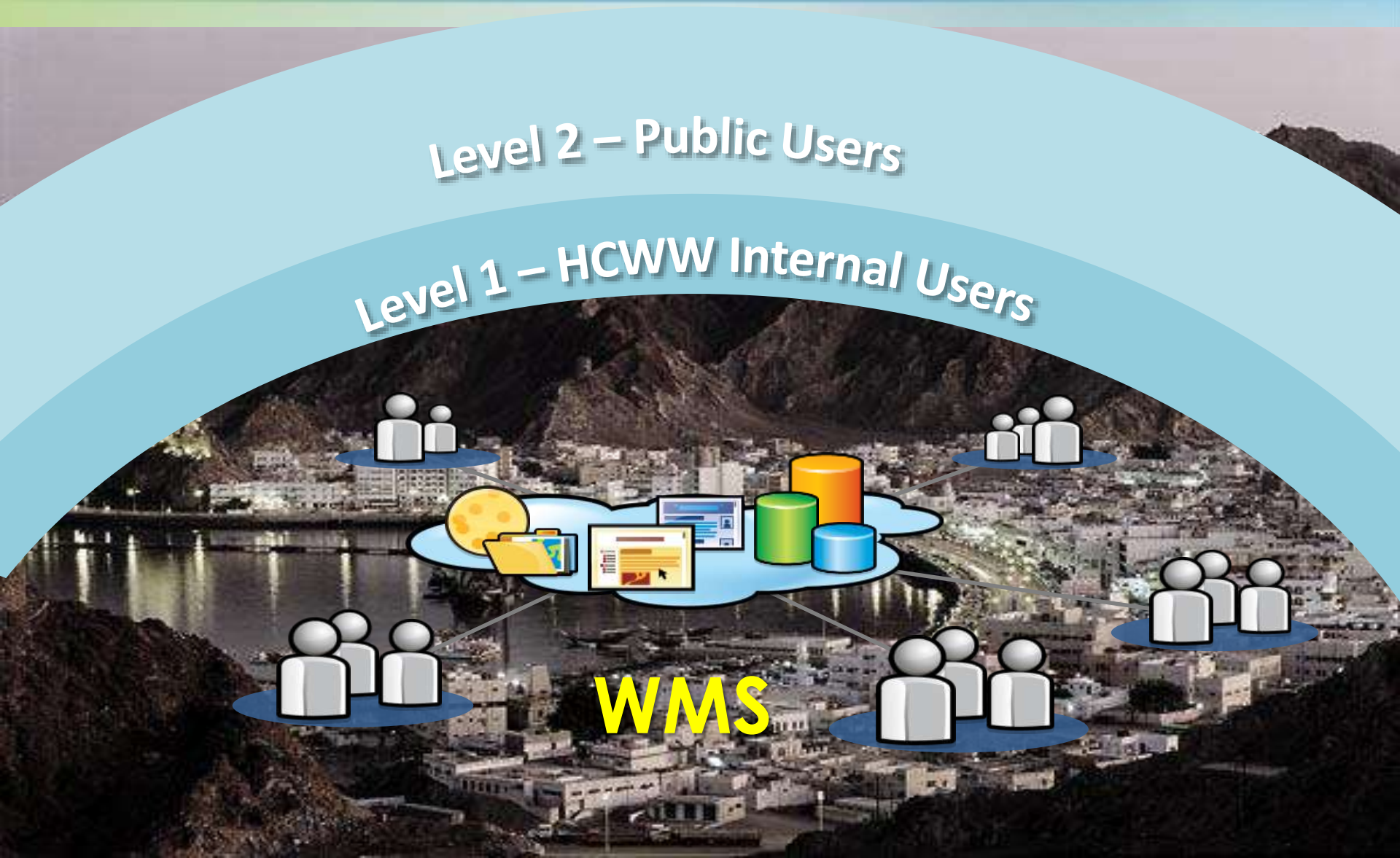
Track Projects

Distribution of complains

& more KPIs


Marketing and Sales
Legend
Zone 11
Zone 12
Zone 13
Zone 14
Zone 15

Extending Awareness



Public Portal

Public Portal

DATA

Data

GIS DB

Other Data

Aim:
allows citizens to submit requests for service. Search for address or click on map to locate your request for service …etc

Main Functions

- Map Navigation
- Base Map
- Bookmarks
- Locate on Map
- Address Search
- Create service request
- Update service request
- Change service request importance
- Show Projects
- Check request status
- Web/ Mobile

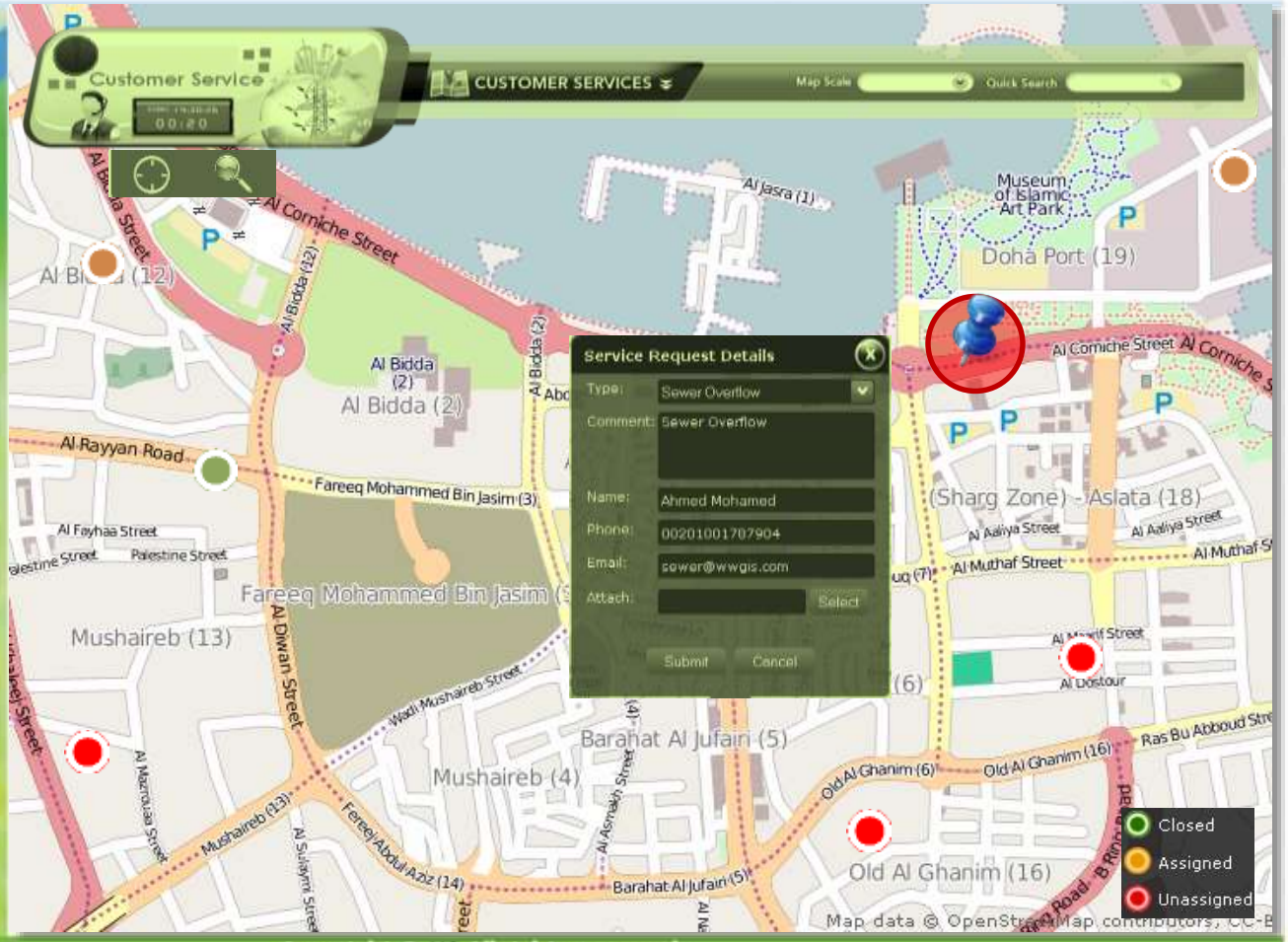
Protecting the Environment, Serving Society

Home | About Us | Projects | Services | Tenders | Careers | Annual Report | Faqs | Useful Links | Virtual Tour | Contact

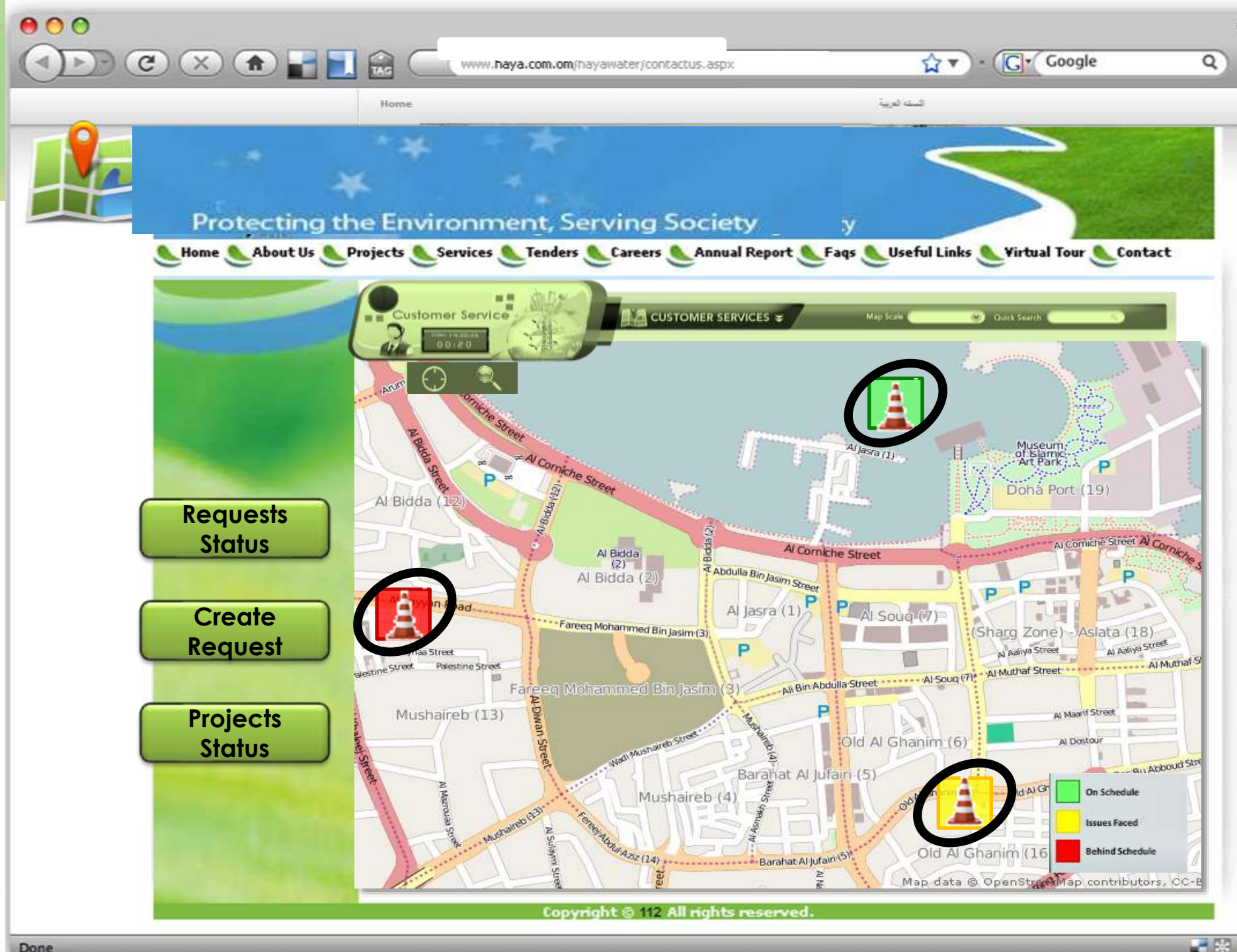
Requests Status

Create Request

Projects Status



Done


www.naya.com.om/nayawater/contactus.aspx
Google
Home
Protecting the Environment, Serving Society
Home
About Us
Projects
Services
Tenders
Careers
Annual Report
Faqs
Useful Links
Virtual Tour
Contact
Customer Service
CUSTOMER SERVICES
Map Scale
Quick Search
Requests Status
Create Request
Projects Status
Al Bidda (12)
Al Bidda (2)
Al Jasra (1)
Al Souq (7)
Doha Port (19)
Museum of Islamic Art Park
(Sharg Zone) - Aslata (18)
Fareeq Mohammed Bin Jasim (3)
Mushaireb (13)
Mushaireb (4)
Barahat Al Jufair (5)
Old Al Ghanim (6)
Old Al Ghanim (16
Al Corniche Street
Abdulla Bin Jasim Street
Ali Bin Abdulla Street
Al Muthaf Street
Al Aaliya Street
Al Maarif Street
Al Dostour
Wadi Mushaireb Street
Al Diwan Street
Fareej Abdul Aziz (14)
On Schedule
Issues Faced
Behind Schedule
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Done

الشركة القابضة لمياه الشرب والصرف الصحي - مصر

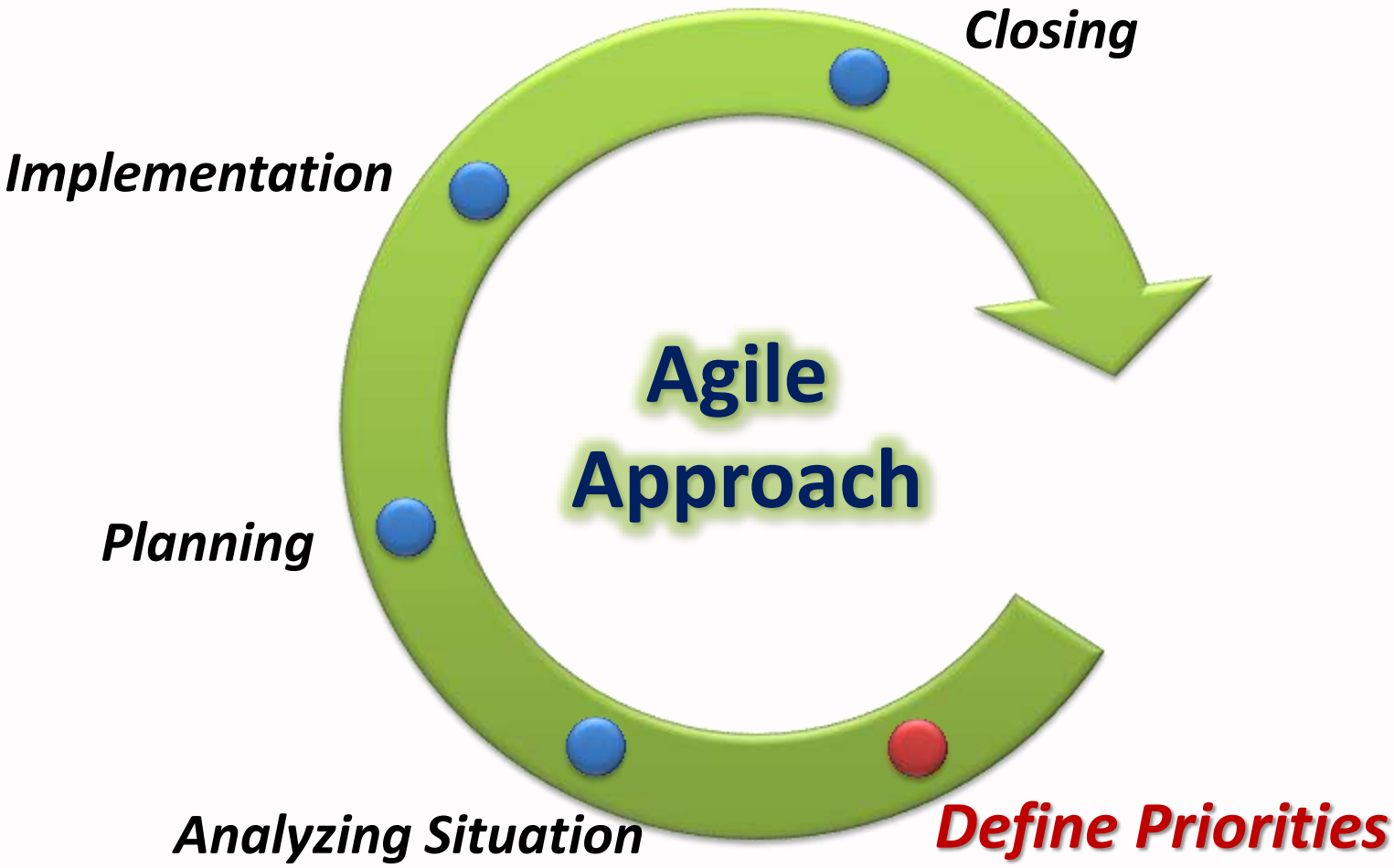
esri Northeast Africa

Agenda

Connecting Gears

- About us
- **GIS for Water Industry**
- Challenges
- Vision
- Solution
- **Roadmap**

Roadmap


Closing
Implementation
Agile Approach
Planning
Analyzing Situation
Define Priorities

Optimize the Way We Operate . . .

How We Plan . . .

How We Organize and Communicate . . .

How We Deliver . . . .

Thank You