GIS, supporting efficient asset management on industrial plants

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Challenges

Industrial Asset Management

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Challenges

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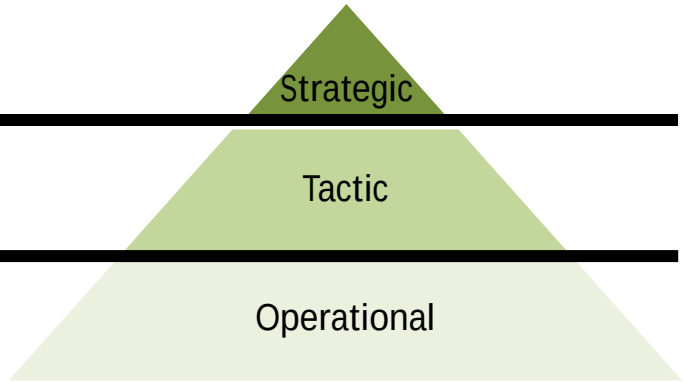
Challenges

Plan – Do – Check - Act -

Level in the organization



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Challenges

Keep Track on Changes
Multiple Independent Construction Activities

Comply with law and regulations
Increasing Demands Regarding Burden of Proof

Aging Workforce
Retirement: 50% in 10 Years, Loss of Expertise

Aging Infrastructure & Installations
Purposive Maintenance

Information Management
Secure, Accurate, Timely Sharing information

Last but not least:
Being cost effective

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Challenges

Information Management

What is where and how?

GIS is complementary to CAD

- **CAD** shows the 'technical what' in detail
- **GIS** adds where and how everything is spatially related, including the functional spatial analytics & calculations

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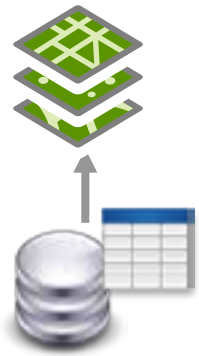
Challenges

Information Management

Integration

GIS allows the integration with other business systems, enabling site managers to analyze and make timely decisions.

Integration



Spatial Analysis

GIS brings specialized spatial information to everyone

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Challenges

Information Management

Disparate Data:

- Analogue paper based maps
- Database / excel storage of administrative data
- File based CAD Drawings)

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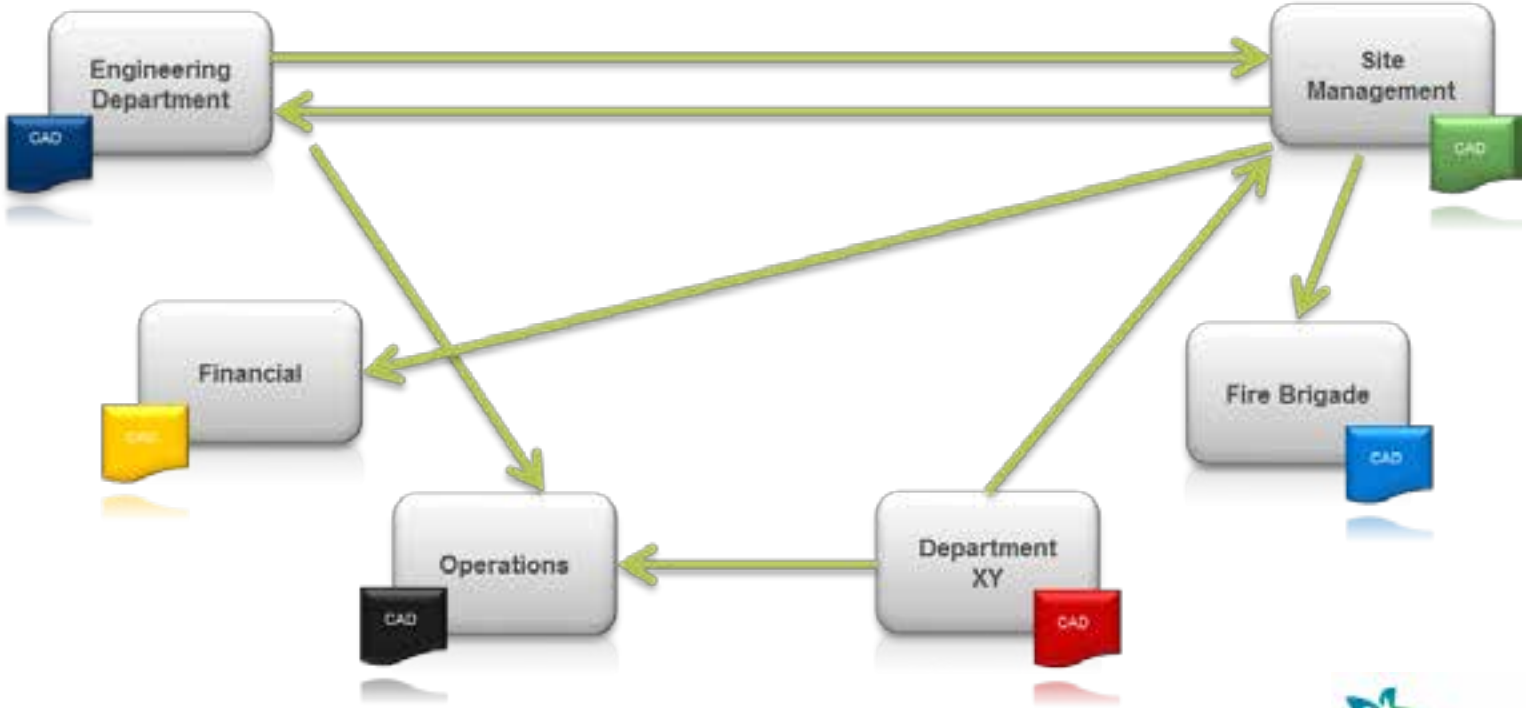
Challenges

Information Management

Decentralized Storage



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Challenges

This all leads to:

- Un-Secure Access to Information
- Discrepancy between Map and Reality
- Related information in multiple systems with different “owners”
- Synchronization of Information

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Who are we?

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esri

Partner
Network
Platinum

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Technology platform

Solution Framework

Domain Expertise

And this is what we offer…

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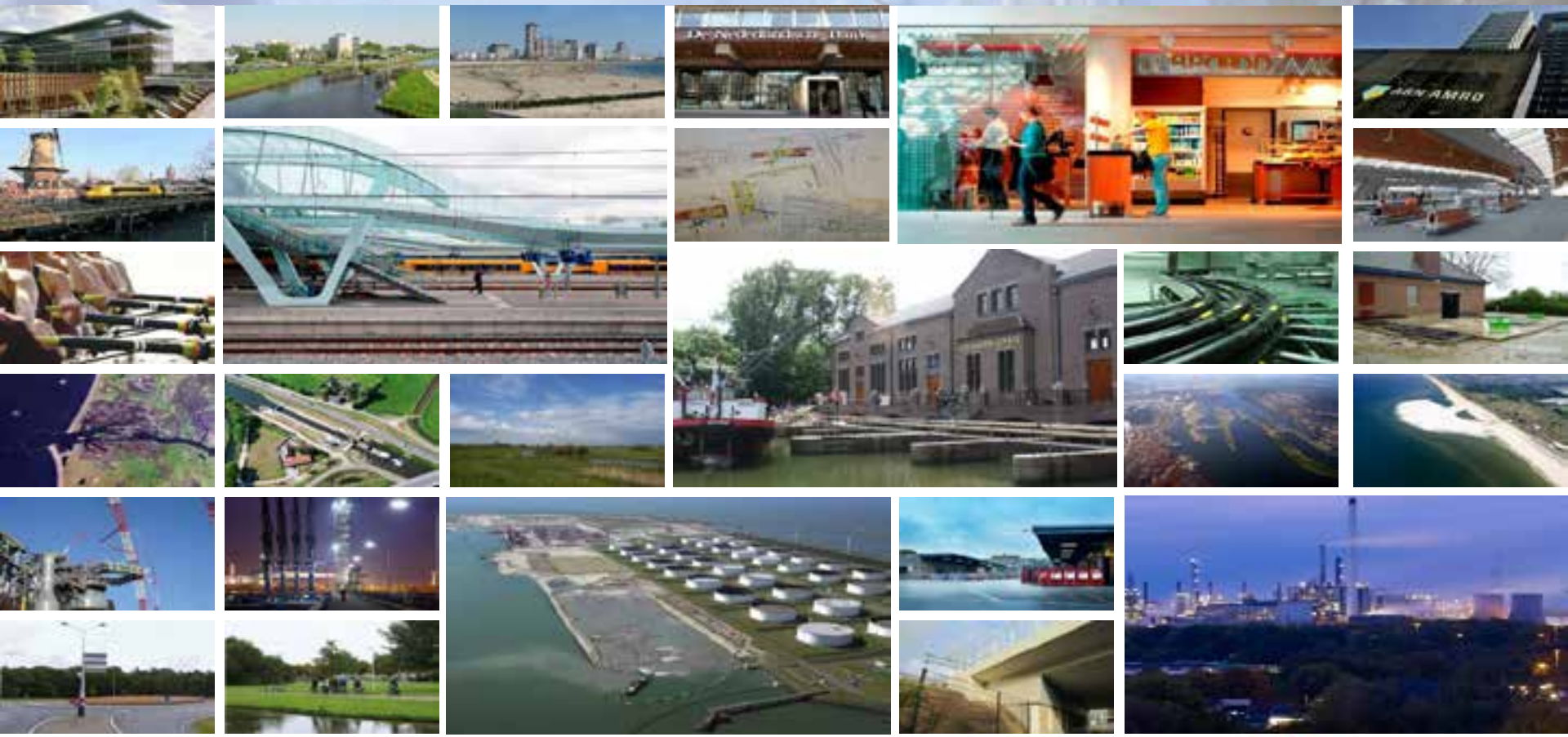
Castor, GIS Based Asset Management

Powered by GEONIS / ArcGIS

Assets touch our daily lives



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Asset Management

Finding optimal balance

Risk based asset management, based on ISO 55000

Needs the right information,

- on the right time
- In the right place
- In the right scale
- On the right device

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Information Today

It’s all about location

We live and act in an information driven society

Computers, phones and tablets gives us access to any information, anywhere and at anytime

Over 70 percent of this information is location based

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...and the same goes for our assets

The coordinate of an asset represents

- Position
- Size
- Spatial impact
- Interspatial relationships with other assets

Adding the spatial component:

- Opens your world
- Adds value
- Makes you more efficient

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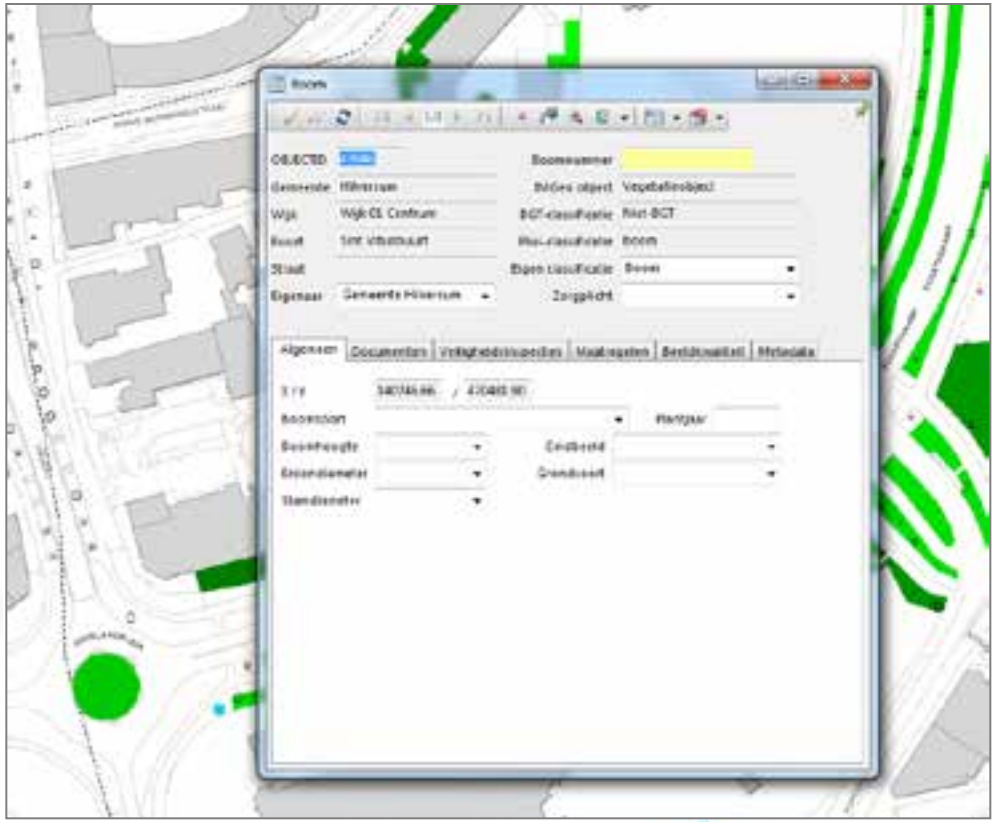
A geo-based approach for Asset Management

The Essence



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A geo-based approach for Asset Management

What is means

Location is known

Interspatial relationship between assets is known

Spatial calculations ready to use

Combination of data sources, maps and web services

Visualization and mapping

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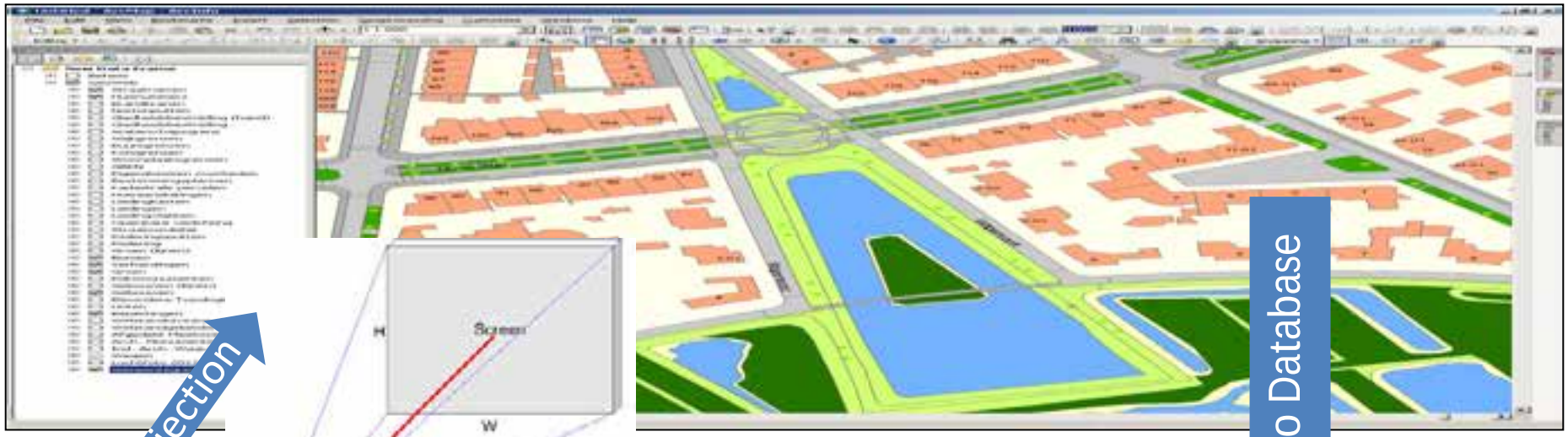
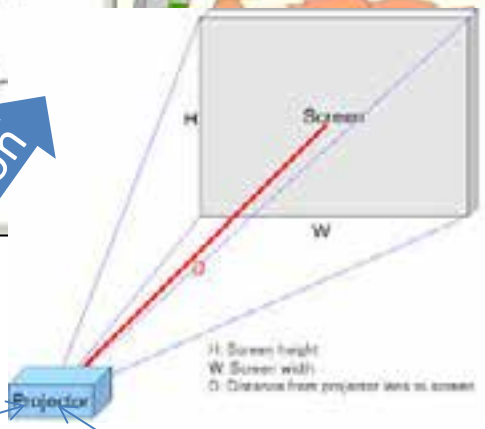
A geo-based approach for Asset Management

The difference





Not: projection

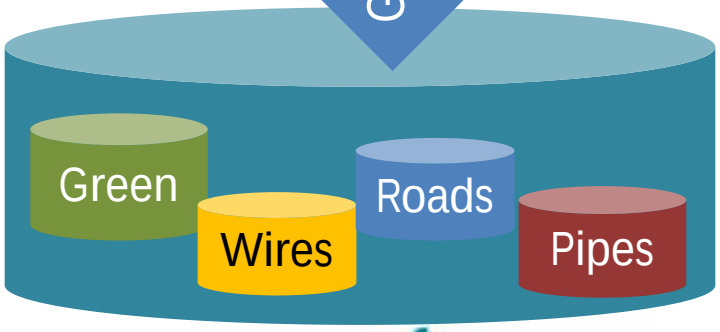
Geo Database

Roads

Wires

Green

Pipes



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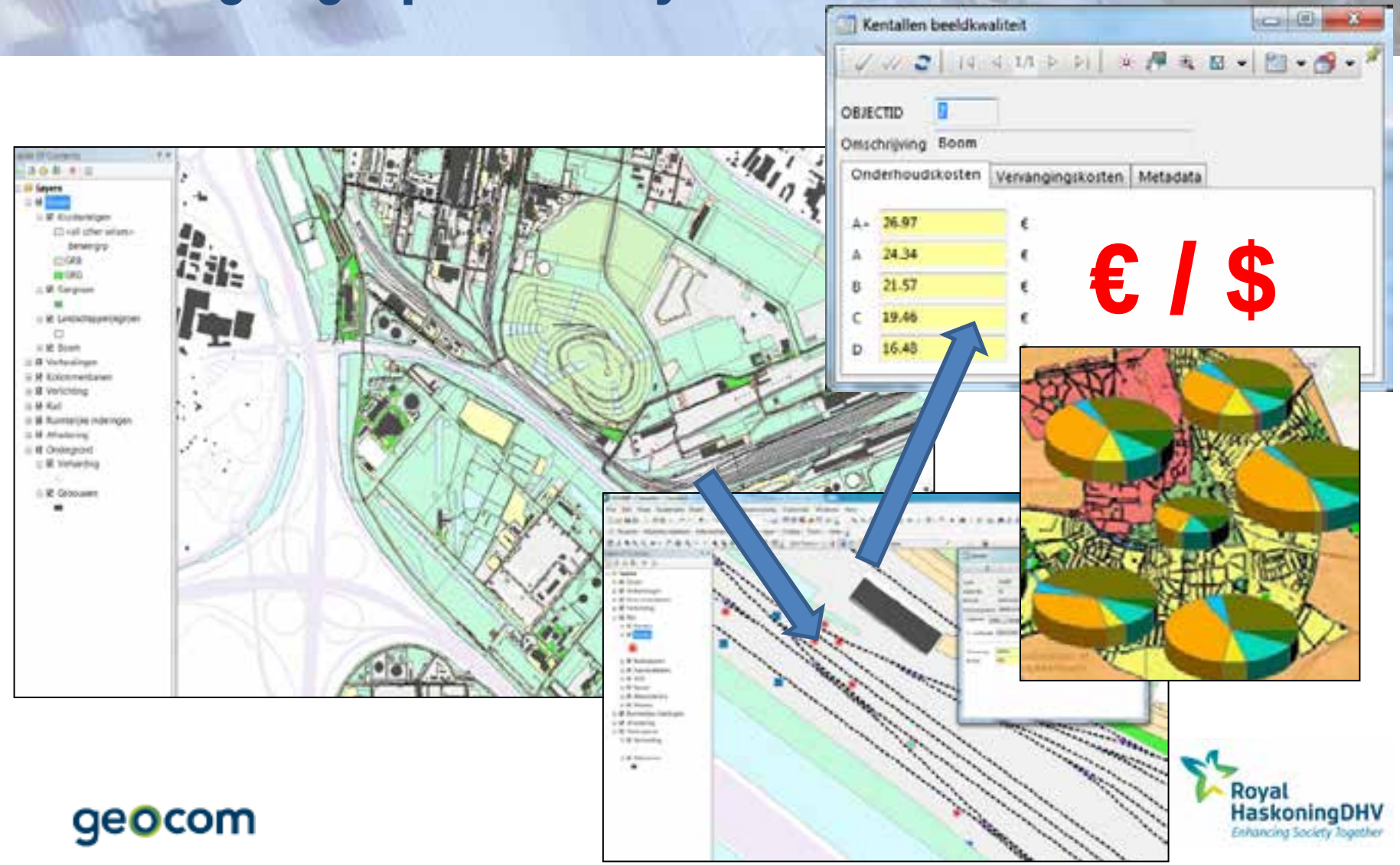
Risk based Asset Management the geographical way



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Sustainability through Configuration

Castor “sits” on ArcGIS and GEONIS.

Castor was configured, using the standard components from GEONIS and ArcGIS

Geographical Based Asset Management

One among other GIS supported processes at industrial plants

Process

- § Turnaround
- § Workforce Management
- § Castor Asset Management
- § Construction Planning
- § Risk Management

Service Packages

Consulting, Configuration, Customization Support

GEONIS Network Solutions

Functions / Templates

- § GEONIS District Heating
- § GEONIS Sewer
- § GEONIS Gas
- § GEONIS Electro
- § GEONIS Water
- § GEONIS Material Supply
- o Custom

GEONIS Facility Solutions

Functions / Templates

- § Pipe bridges
- § Technical Facilities / Installations indoor/outdoor
- § Tank Farm Management
- § Chimneys
- § Boundary Fencing
- § Individual Objects
- o Custom

GEONIS Area Solutions

Functions / Templates

- Green Areas
- Security Management, Risk Areas, Security Zones
- Parcel Management, Real Estate
- Location and Construction Areas
- Contaminated soils. Soil Management
- o Custom

GEONIS Logistics Solutions

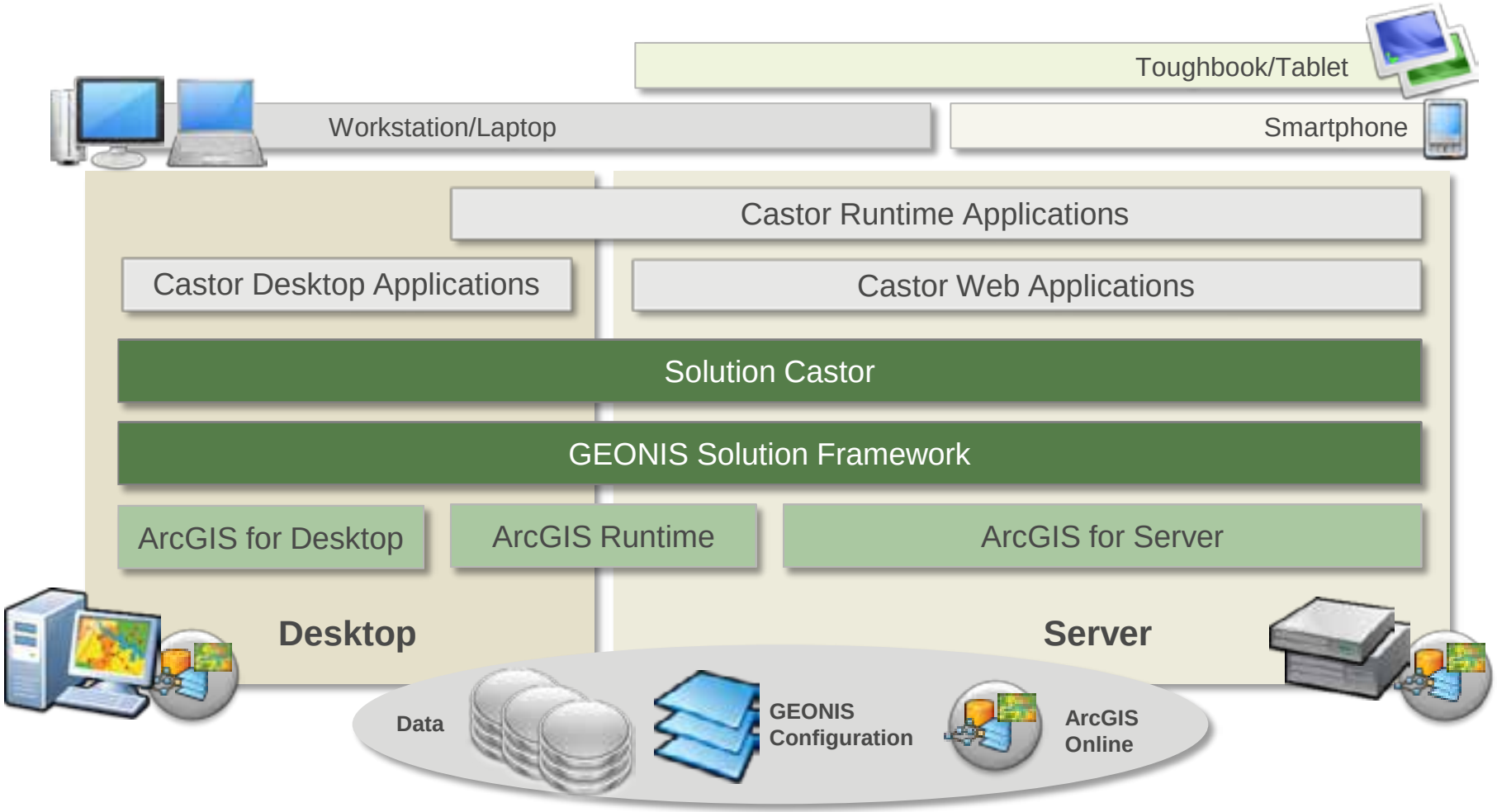
Functions / Templates

- § Rail
- § Roads, Parking
- § Street Network Manager
- o Custom

GEONIS / ArcGIS Core Solutions Technology

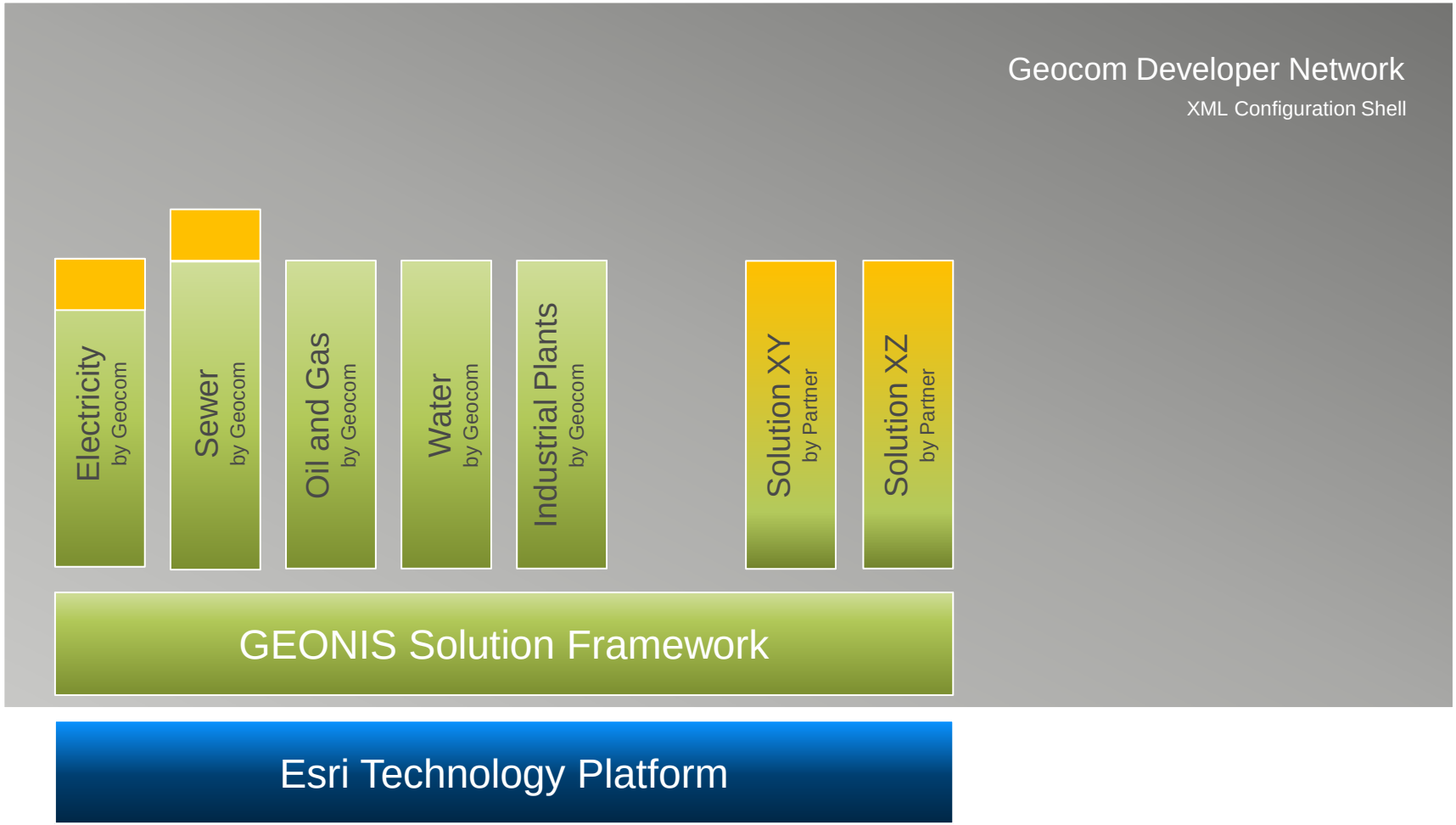
Database

One solution, many options



Sustainability through Configuration

And this is how it works



Sustainability through Configuration

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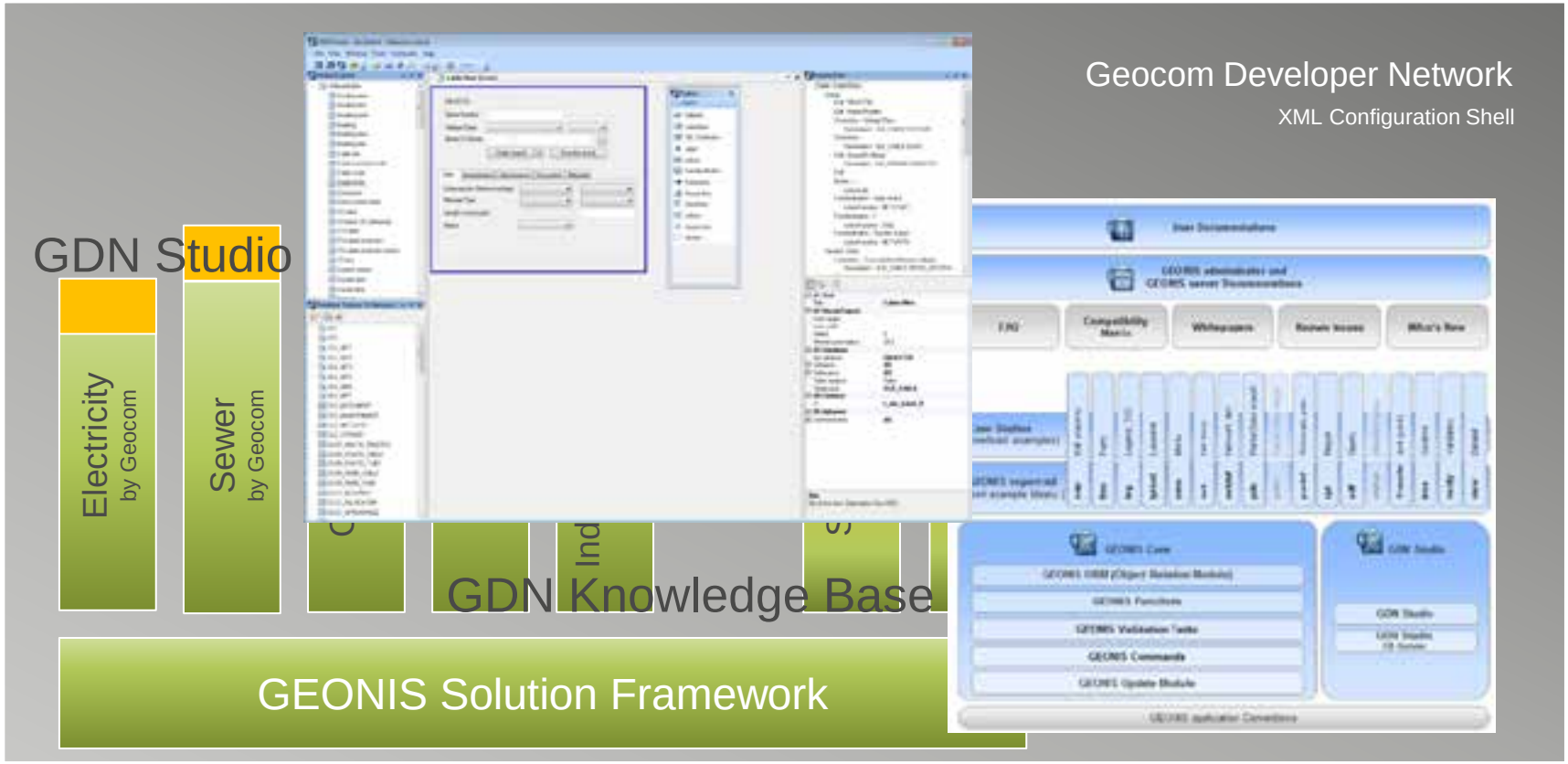

Esri Technology Platform

Sustainability through Configuration

And this is how it works

Sustainable
GEONIS Overloading Mechanism

And this is what we cover…

3 User Cases examples
Site Construction / Maintenance
Incident Management
Site Navigation

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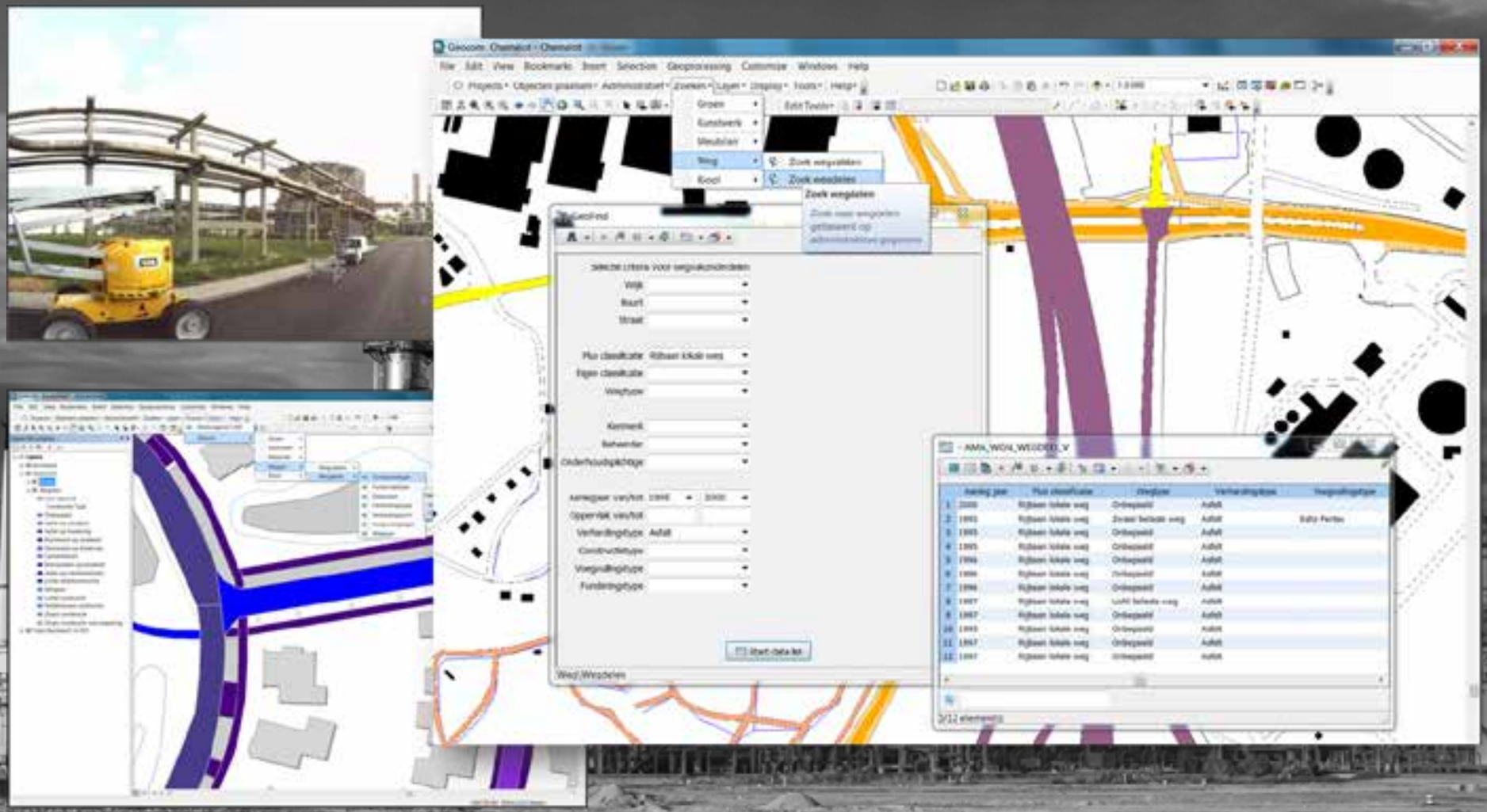
Site Construction / Maintenance

Example Chemelot (NL)

195 km sewerage
80 km roads & 20 parking lots
200 hectare landscaping on site
500 hectare landscaping off site
3 contractor shed parks
16 bridges and structures
40 km column racks
1 harbor
80 km rail

Site Construction / Maintenance

Spatial Search Query



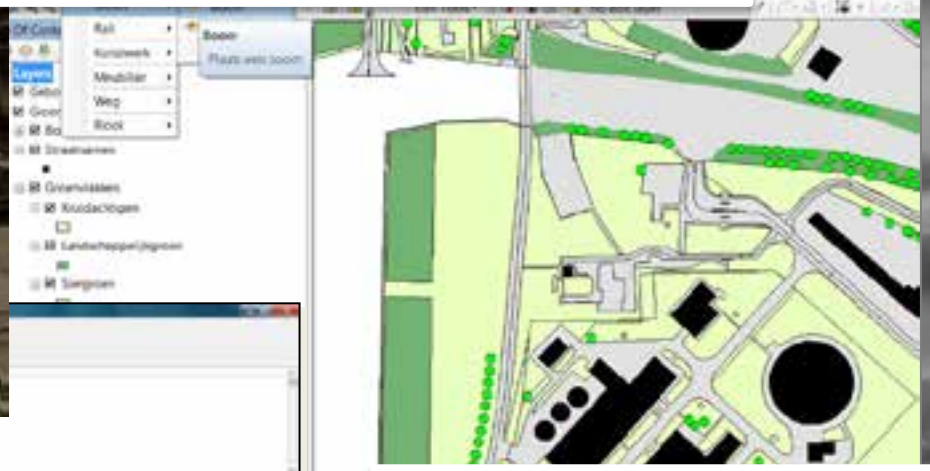
Site Construction / Maintenance

We need to build a new Installation. How does this fit to the excising infrastructure?

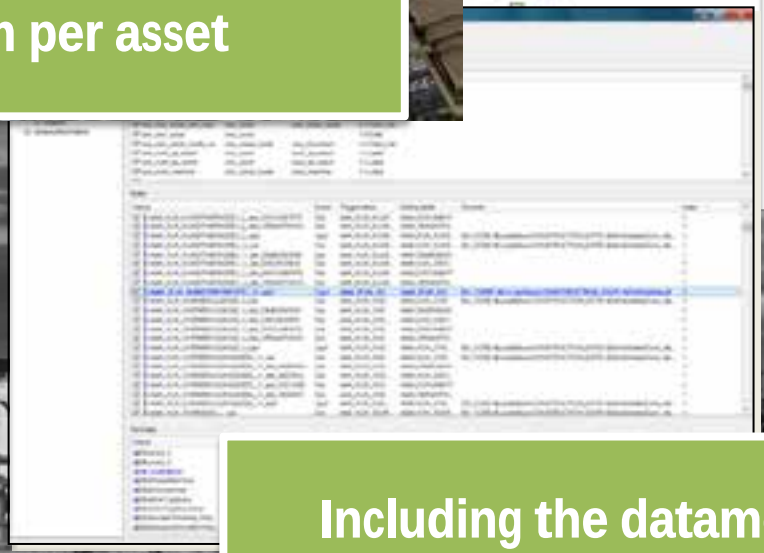
Site Construction / Maintenance

Scalable, Configurable

Linking objects and information



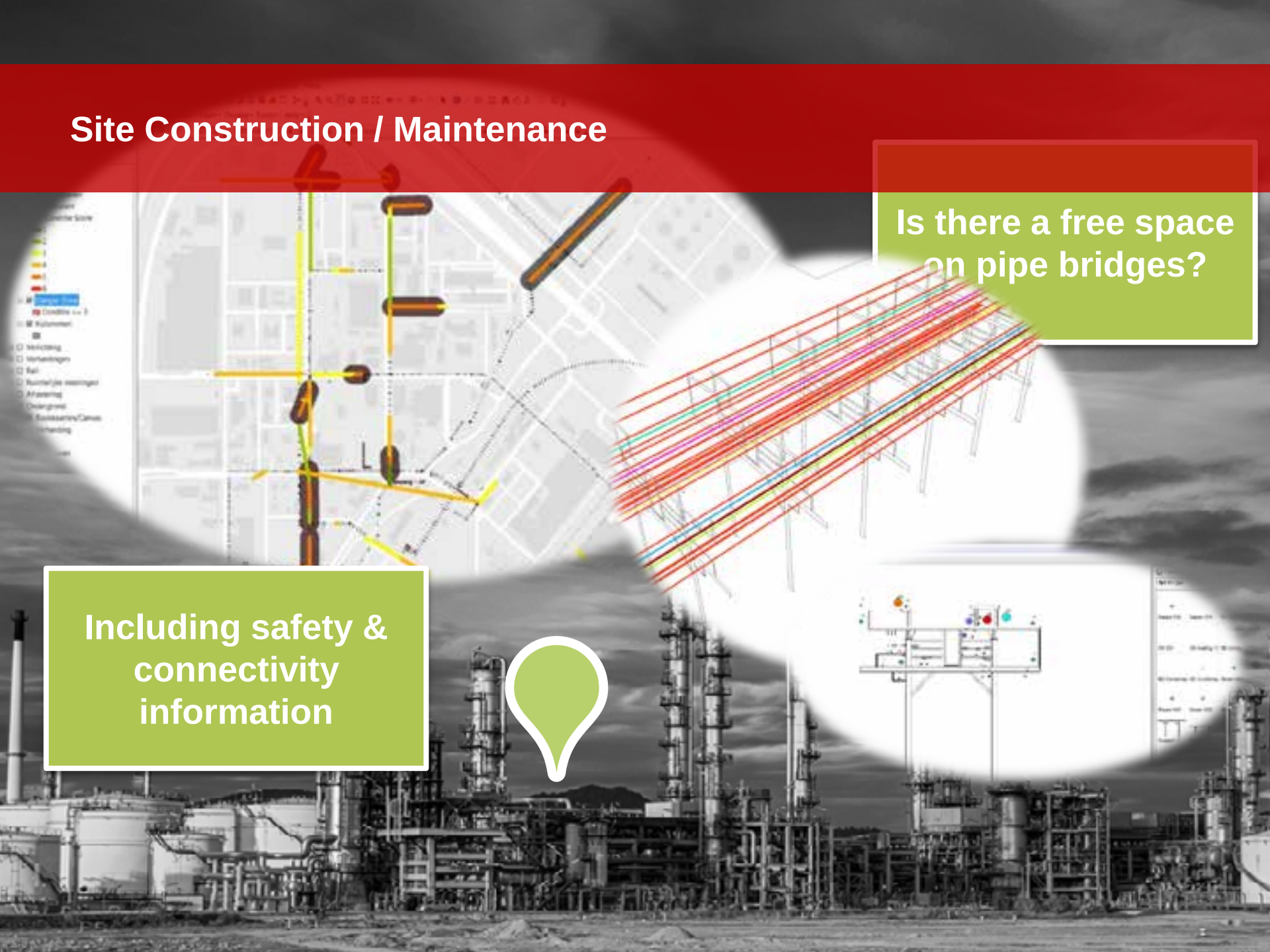
Custom form per asset



Controlled update conditions

Including the datamodel

Site Construction / Maintenance



Site Construction / Maintenance

How are the relations?

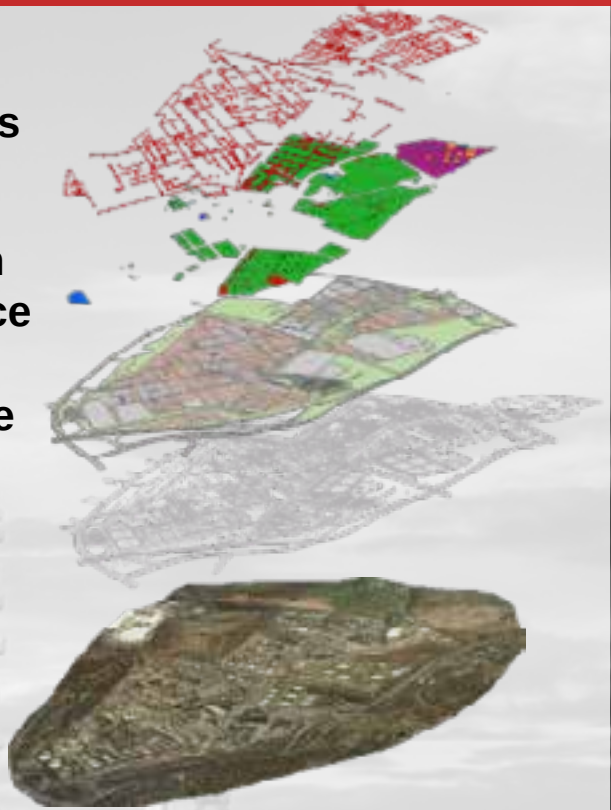
Networks

Munition Clearance

Land use

Borders

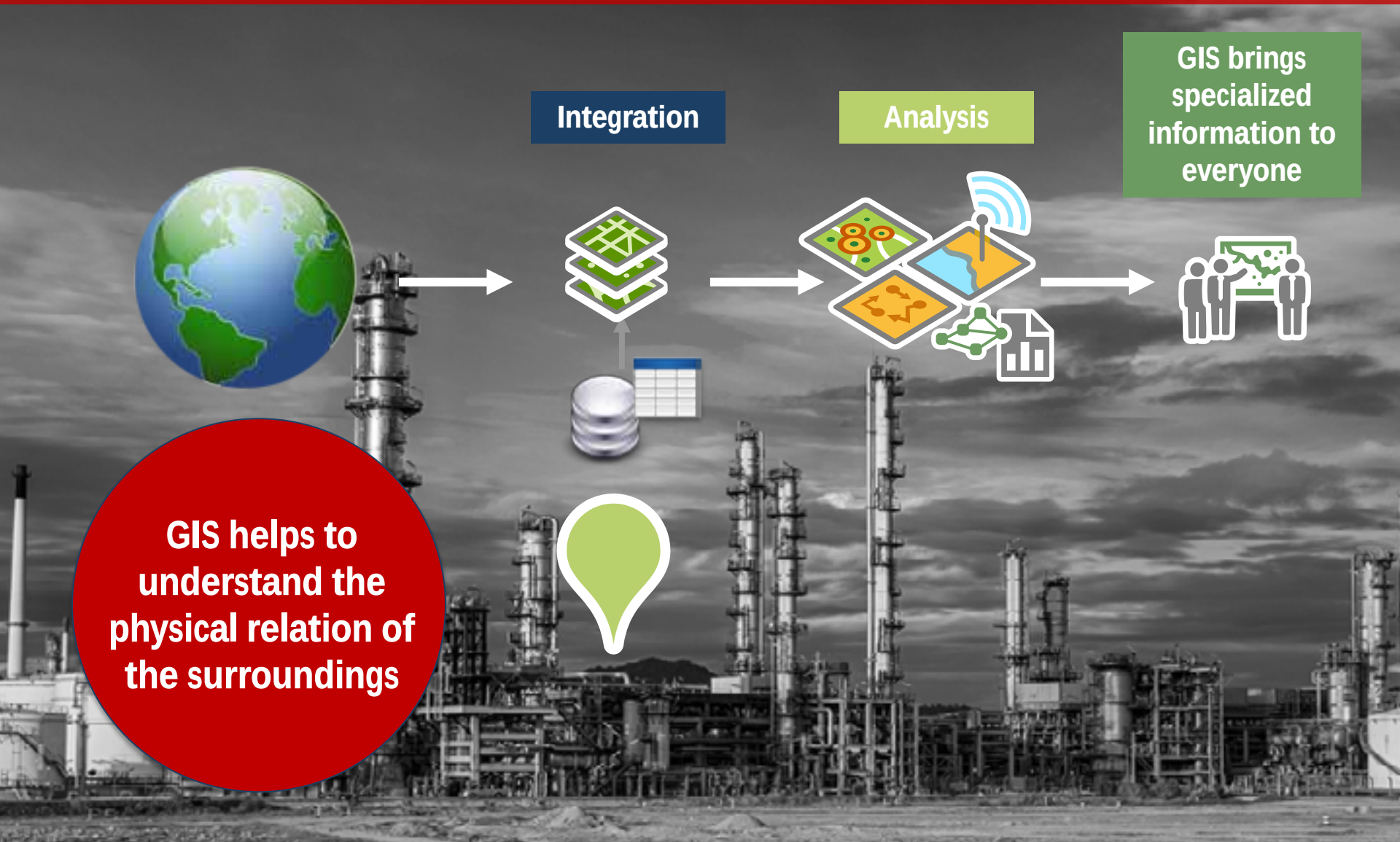
Reality



Site Construction / Maintenance

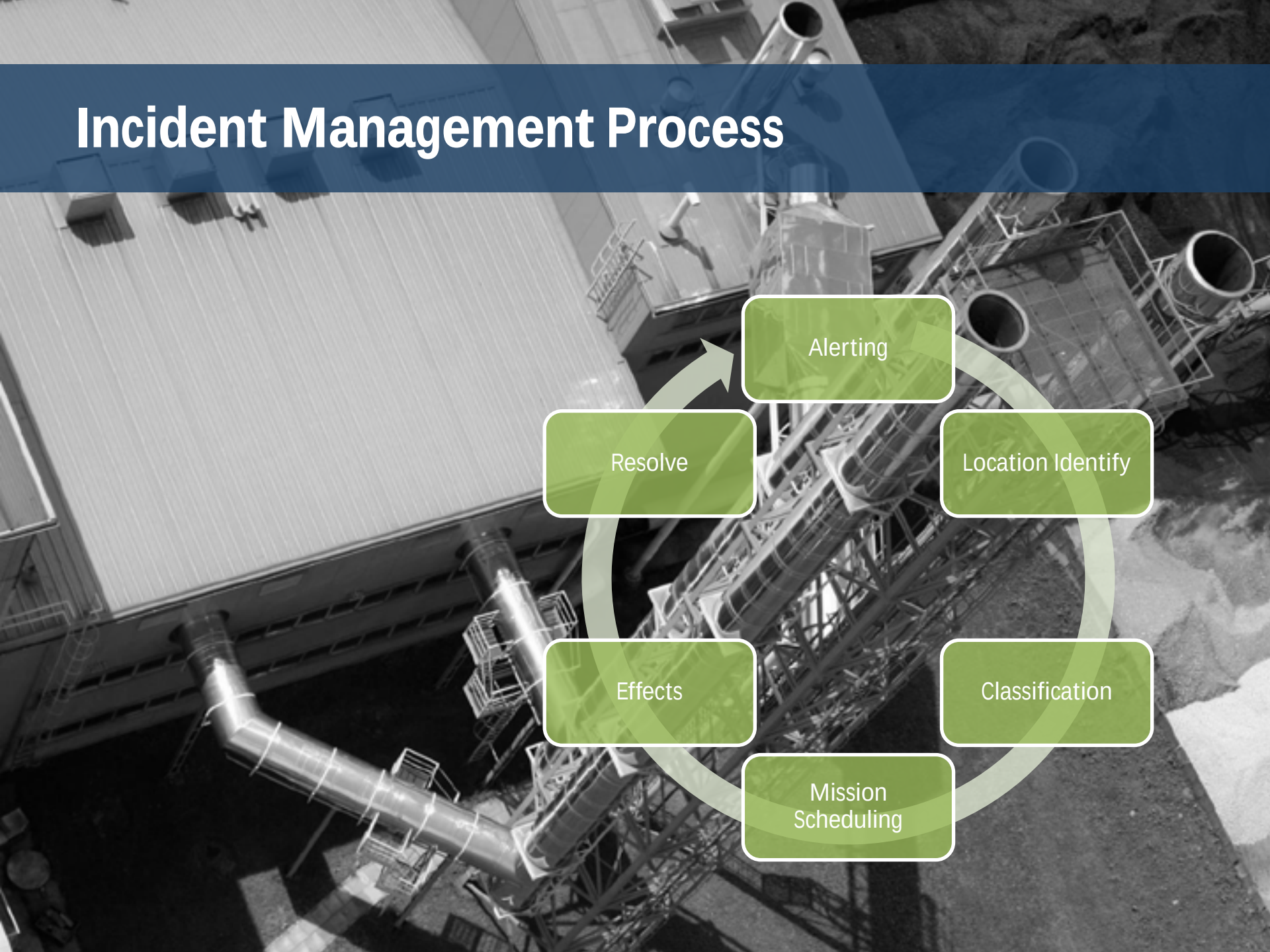
Environmental issues (subsurface) ?

Site Construction / Maintenance



Incident Management

Incident Management Process



Fast acting is key!

Castor is a location intelligence application

Monitoring service → Location → Identification → Classification

Castor is a location intelligence application

Where is the problem?

Leakage... Gas escapes. What kind of Gas? Steam? Chloride?

What is connected? What is affected?

Which valves need to be closed?

Can we re-route the production?

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Resolve

- Improve coordination of activities
- Timely and accurate decision making
- Fast resolving

Site Navigation

Common situation on industrial plants

- A large portion of the plant traffic consists of the delivery vehicles of different carriers
- large, complex infrastructures
- (temporary) restrictions
- high traffic
- often confusing / unfamiliar infrastructure
- Deliveries to spec. timeslots
- Access via gates
- Delivery to loading points
- no local knowledge of the drivers

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Actors Involved in Plant Navigation

Different stakeholders are involved in the processes and procedures of the plant navigation

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GIS-based Navigation

Routing is based on your own road network with specific rules

- Roadway Arrangement
- Barriers
- Live Traffic Situation
- Specific Driving Instructions

GIS-based Navigation

What we support

- Add the plant infrastructure to e.g. Navteq Data
- Support the delivery traffic with navigation
- Safe bypass of restrictions and obstacles
- Smooth delivery traffic
- Traffic control and monitoring
- Avoid traffic backlog on factory premises and parking areas
- Increase the utilization of the loading points
- Risk reduction by minimizing the time on the site

References

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References

EVONIK INDUSTRIES

Continental

SOLVAY

VOITH

PRAXAIR

Das Auto.

WACKER

HEIDELBERGCEMENT

bp

chemelot

YARA

CLAAS

BOSCH

Follow me! EADS

DAIMLER

BASF

CRONIMET

...and many more

Summarizing

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Solution

GIS Based Asset Management

GIS Based
Asset Management
With Castor

Spatial Information
- Network Intelligence
- Asset Reporting
- Validation / Consistency
- Network Analyses
- Visualization in global spatial context

Maintenance Operations
- Work Order Management
- Resource planning
- Financial Controlling

GEONIS
for Industrial Plant Management
powered by ArcGIS

Bring together what belong together

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Solution

GIS based Asset Management enables Site Managers:

- To improve coordination of activities
- Making timely and accurate decisions
- Stream Line maintenance activities – set the right focus
- Keep the information systems in sync with each other and with reali
- Make the data available throughout the Esri Technology Platform

See the Big Picture
Lower the Cost of Ownership

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Thank you for attending!