Application of Geospatial Technology to Improve Operational Efficiency & Sewerage Asset Management

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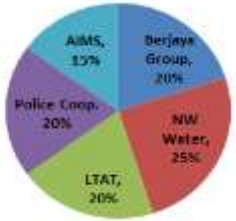
IWK Overview

Evolution of Ownership

1993-1995



1995-2000, Privately Held

Prime Utilities Berhad

2000-Present, Owned by MoF , Inc

Services Dimension

87 LAs in 10 states and 3 federal territories

23.1 million connected population equivalent nationwide

3,617,071 billed customers

Asset Dimension

6,540 sewage treatment plants

1,063 network pump stations

18,153 km sewer lines

1.27 million individual septic tanks

Manpower and Resources

3,359 employees

21 unit offices

4 labs

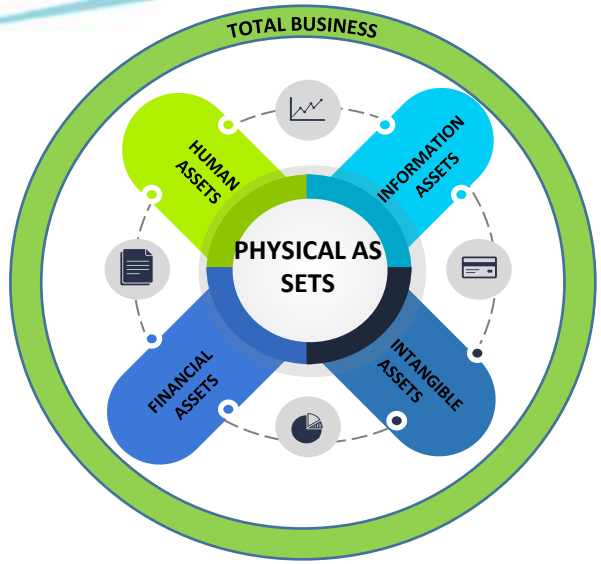
73 reporting centres

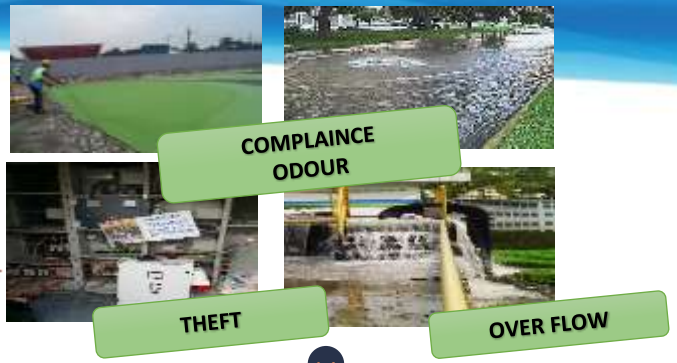
1 Research centre

607 vehicles

1 training centre

Asset Management in IWK





In 2010 – IWK adopted BSI PAS55:2008 as the basis of developing IWK's Asset Management System.

Systematic & coordinated activities/ practices through which an organization optimally and sustainably manages its assets & asset systems, their performance, risks & expenditures over their life cycles for the purpose of achieving its organizational strategic plan.

BSI PAS55:2008 Asset Management System Structure

LINE OF SIGHT

Organizational Strategic Plan

- Company goals to meet legal and stakeholders expectation

Asset Management Policy

- Broad statements and mandated requirements in line with Corporate Strategic Goals

Asset Management Strategy

- Methods by which the Policy will be pursued

Asset Management Objectives

- Measurable Targets on continual improvement basis

21 Asset Management Plans (annually)

- Detailed plan(action, responsibilities, resources & timescales intended) to achieve Objectives

ENABLERS & CONTROLS

a) **Structure Authority & Responsibility** – Steering Committee & Risk Committee

b) **Training Awareness & Competence** – Competency Matrix

c) **Communication** – Asset Management Bulletin, AMP Poster, Change Management- visiting Unit Offices.

d) **Information Management** - AMIS, SAP, ARMS, LMS, COEDS,BRAINS, IGIS. Asset Data Model & System Data Map.

e) **Risk Management** – Framework and System

f) **Legal** - Regulation Register

g) **Management of Change** – Driven by AMU together with Steering Committee

Geospatial Technology Development

• 1994 - 2009

- ❑ Desktop GIS
- ❑ Used Map Info Professional
- ❑ Data Conversion &
- ❑ Compilation

MapInfo

• 2009 - 2015

- ❑ Enterprise GIS (IGIS) :
- ❑ GIS application in CMS, fleet management
- ❑ System enhancement

INTERGRAPH

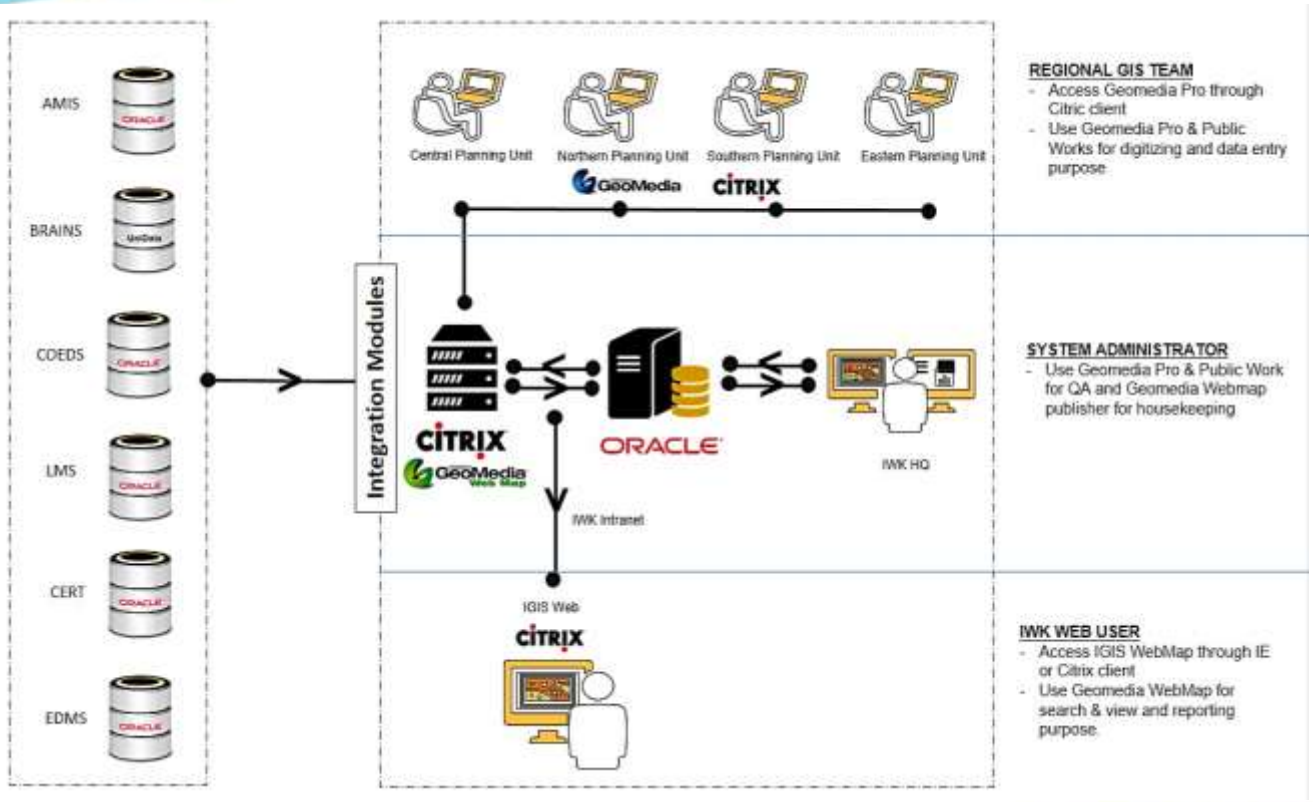
iGIS

• 2016 & Beyond

- ❑ Integration with SAP ERP system
- • Linear Asset Management
- • SAP Work Manager @ Syclo
- ❑ Integration with CRM
- ❑ Operational Dashboard
- ❑ Public Engagement

SAP

IGIS System Solution / Enterprise GIS



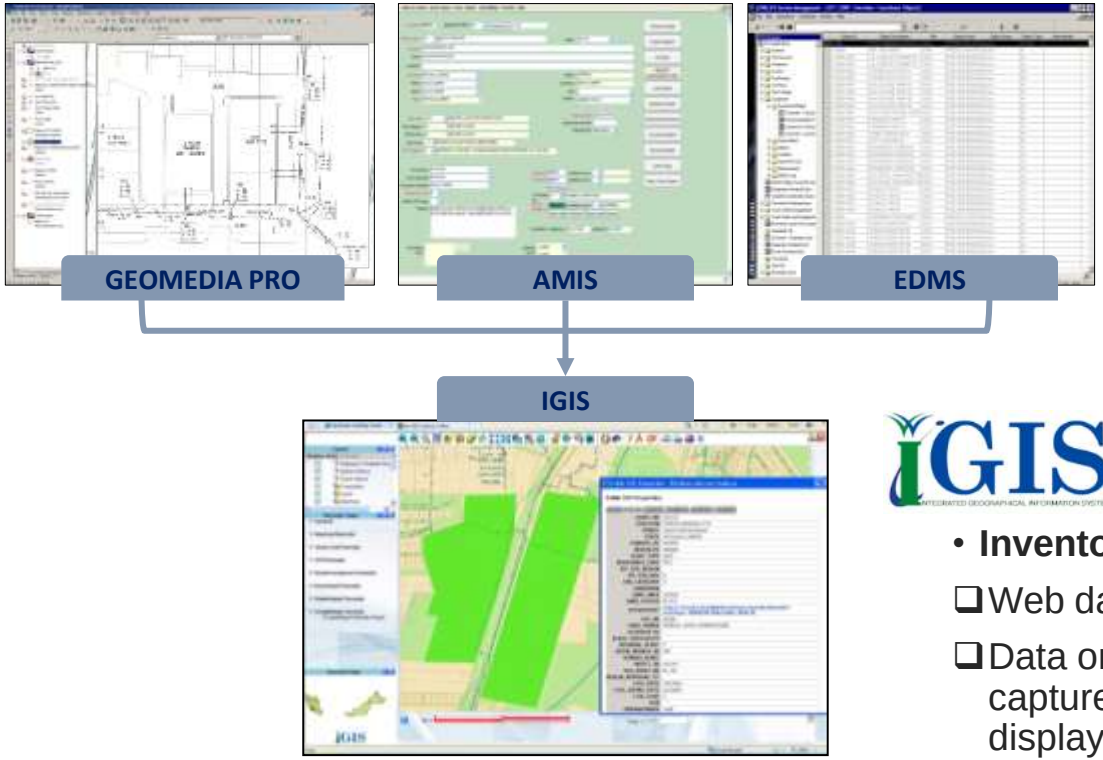
GeoMedia Web Map

ORACLE

CITRIX

GeoMedia

Asset Registry & Inventory



- ❑ Digitizing process of maps and drawings
- ❑ Data conversion
- ❑ Integrating GIS with other asset database
- ❑ Establish ISO 9001:2008 Quality Management System for GIS Data Management

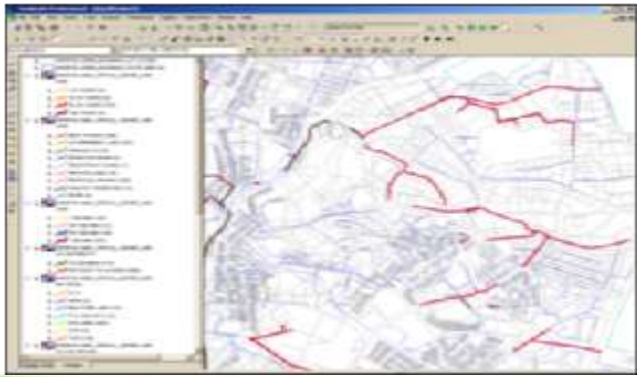
iGIS

- **Inventory for Linear & Non Linear Asset**
- ❑ Web dashboard to users
- ❑ Data on linear asset & non linear asset are captured, stored, validated, analyzed and displayed as geo-information

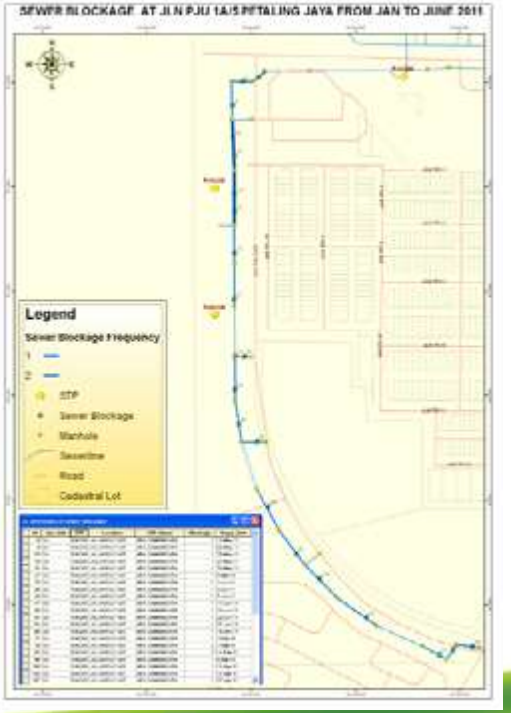
Asset Criticality

- Criticality criteria to assist in the decision making and prioritization of critical assets (STPs and Sewers). The criteria were divided into two aspects which are:
  - ❑ Static criteria- which are inherited issues and risk. Generally do not change from day to day.
  - ❑ Dynamic criteria- Based on actual incidences: eg non-compliance, complaints, accidents, high costs etc.
- A combination of these indices will be used to zoom in on risk areas, triggers for root-cause analysis and asset improvement programs.

STATIC CRITICALITY – Unchanging parameters



Dynamic Criticality –
Analysis based on actual incidences

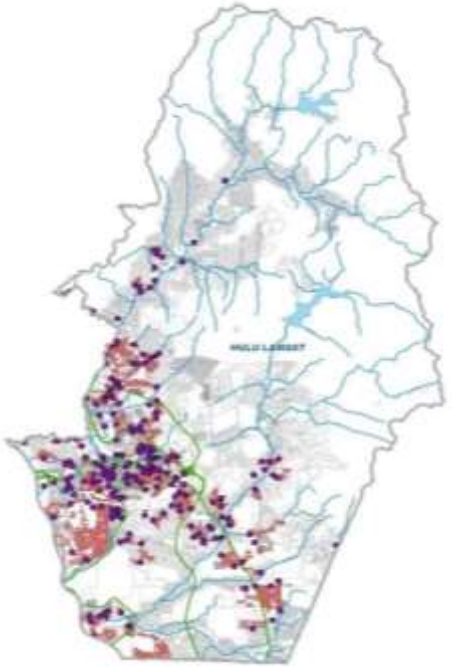


Sewerage System Planning

Planning New Sewer Pipeline

STP Rationalization

Catchment Strategy Planning

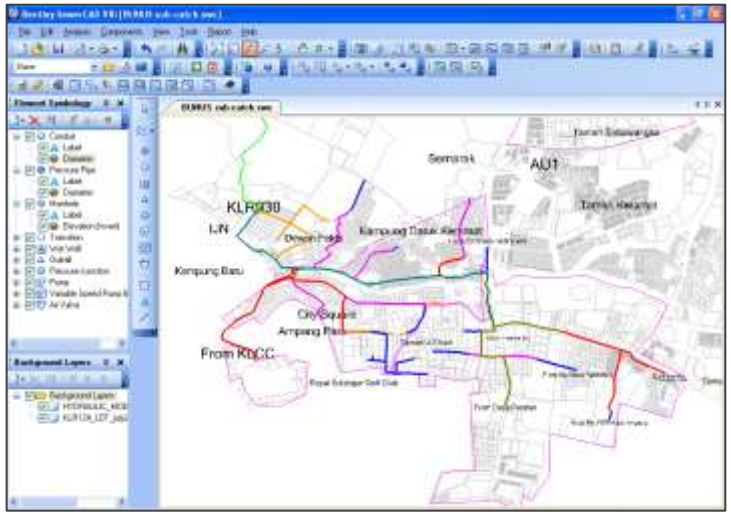


GREATER KUALA LUMPUR/ KLANG VALLEY

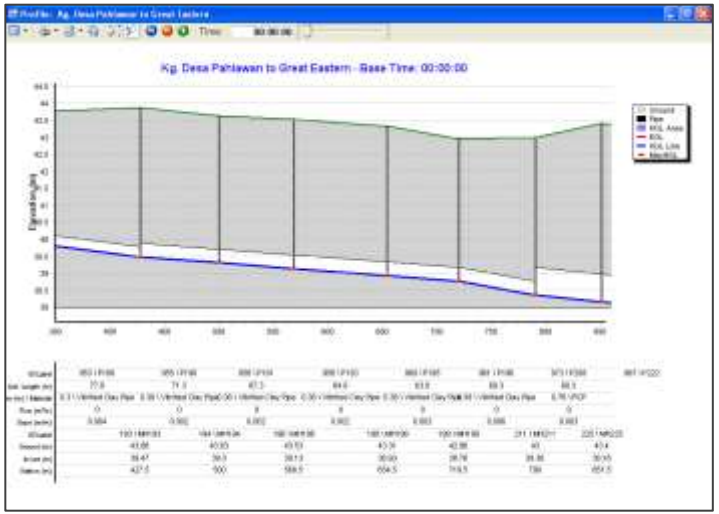
RIVER OF LIFE

Hydraulic Modeling

- Using Bentley SewerCAD Software for hydraulic modeling
- GIS ready format data exported from GIS



Sewerage Hydraulic Model

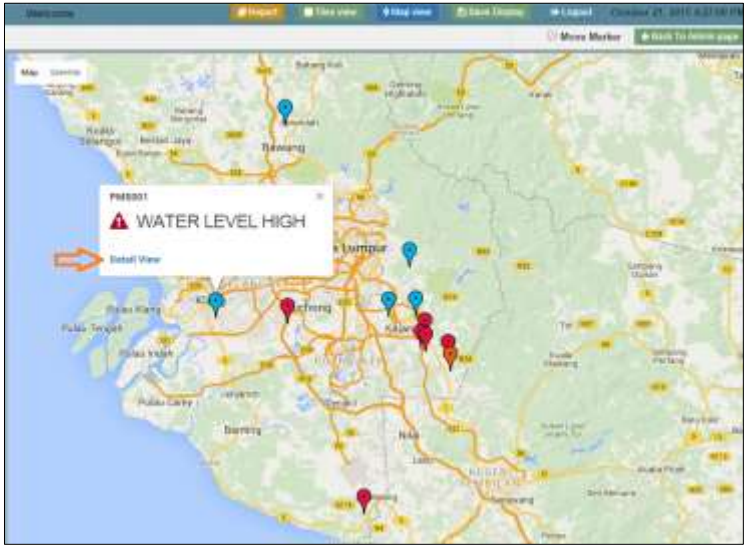


Hydraulic Profiling

Control Monitoring System

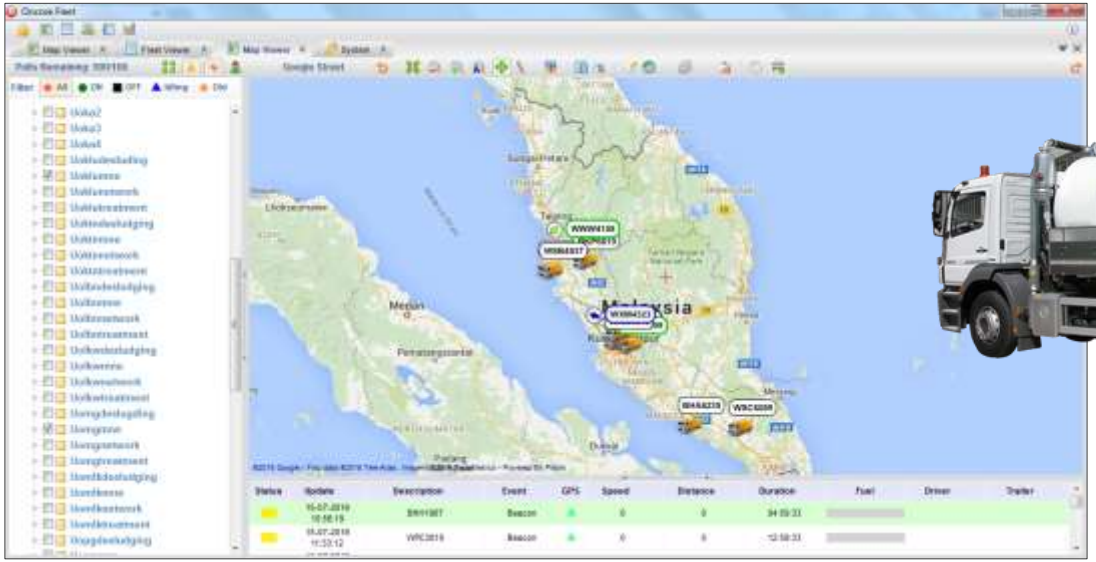
- Dashboard GIS-Based for monitoring the asset.
- Showing live data.
- Integration with Early Warning System

Web Dashboard



Fleet Management System

- Dashboard GIS-Based for monitoring all the fleet in real time
- GPS and devices installed in fleet to vehicle tracking and fleet management

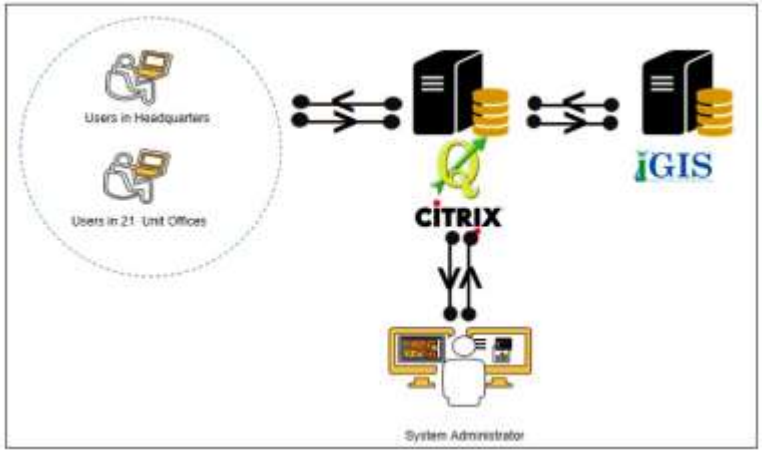


Identifying Non Revenue Customer (NRC)

- GIS analysis used in detecting and identifying suspected Non Revenue Customer (NRC) by reconcile and geocode customer address
- Site verification done to confirm the NRC and account created in billing system

Application of Quantum GIS (QGIS)

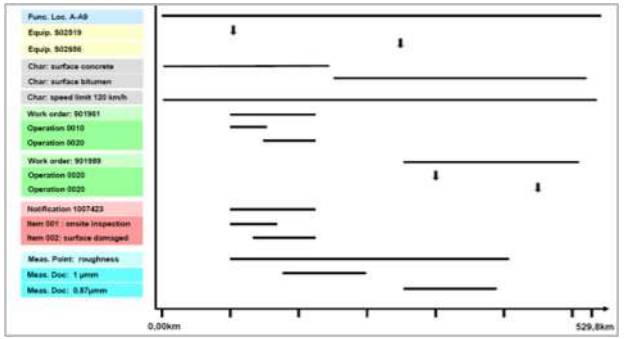
- Using Open Source Software, Quantum GIS (QGIS) for managing, capturing, and registering network maintenance information
- Being used by network personnel in unit office (52 users)



Way Forward

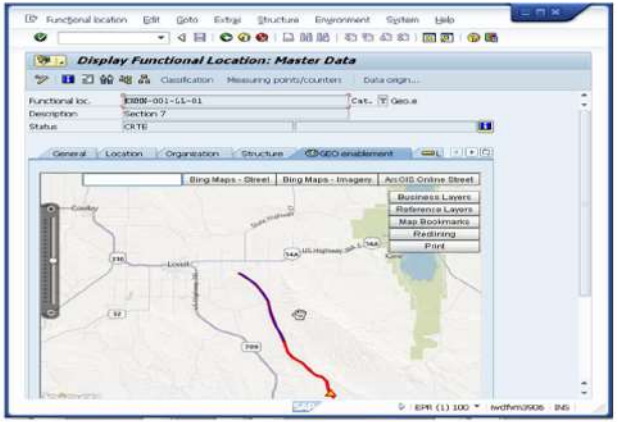
SAP Integration

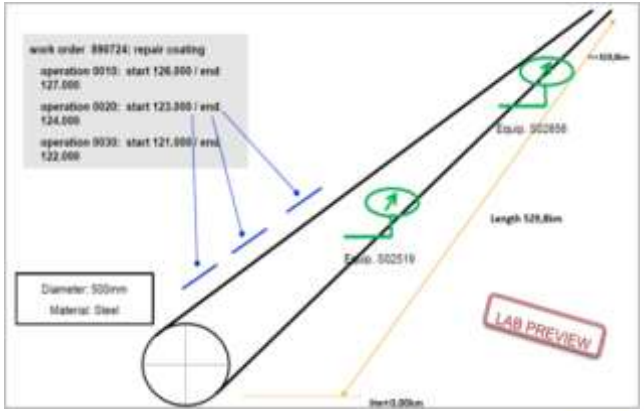
- IWK has embarked into the SAP to replace the existing ERP systems
- Consists of several SAP modules (EAM, FICO, HCM, SRM, GRC, EHS)
- One of the implementation is to integrate IGIS with SAP Linear Asset Management Module & Work Manager (Syclo)



Linear Asset Management

- In “Asset Intensive Industries” the utilization of traditional hierarchical structure of assets to represent linear assets is a complex and difficult process .
- Linear Asset Management is functionality within the Plant Maintenance (PM) module which is especially designed to meet the complex requirements of linear asset maintenance through dynamic segmentation.
- IGIS will be integrated with this module.





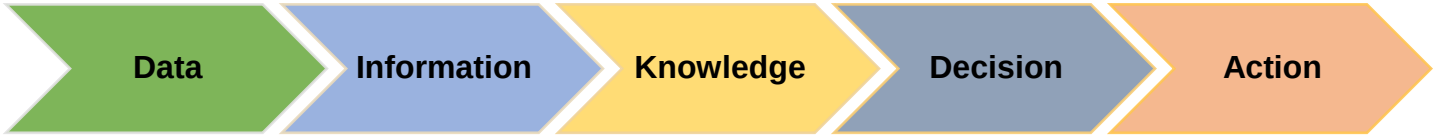
Geospatial Technology Road Map

Asset Management	Planning & Analysis	Field Mobility	Operational Awareness	Constituent Engagement
				
Collect, organize & exchange data	Transform data into actionable information	Get information into and out of the field	Disseminate information where and when is needed	Get feedback and make informed decision

Complete and integrated workflows and systems

Conclusion

- Previously, IWK was relying on office base data. No proper system to store, organize , analyze and make available the information to the staffs for proper decision making.
- IWK's strategic approach:



- For IWK, using the Geospatial Technology has been a great aid in graphically presenting geo-referenced information and using it as an enabler for decision making. We plan to look forward in improving what we have now and embarking into new innovation for the future.
- Geospatial Technology is not just an optional supporting system for enhancing IWK Asset Management System, but it is turning out to be the KEY ENABLER for IWK in managing our sewerage assets and improving operational efficiency.

Syarikat Pembangunan Nasional Anda
Indah Water Konsortium Sdn Bhd

THANK YOU

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For more info and queries please visit our website

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