Digitalization in Road Construction

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L&T Oman

Who are We ????

LARSEN & TOUBRO LIMITED

- Founded in April 1938 by

- Mr. Henning Holck-Larsen

&

Mr. Soren K. Toubro.

Local Presence

LARSEN & TOUBRO (Oman) LLC

Year of Incorporation - 1994

Core Business Areas

B&F

- ✓Mega Townships
- ✓ Housing development
- ✓ Commercial Buildings
- ✓ Institutional Buildings
- ✓ Cement Plants
- ✓ Hangar Facilities
- ✓ MEP Works

PT&D

- ✓Transmission lines
- ✓ EHV & HV Substations
- ✓ EHV & HV Cabling Works
- ✓ Overhead Lines
- ✓ Industrial Electrification

TI

- ✓Bridges
- ✓Roads
- ✓Runways

M&M

- ✓Industrial Projects & Utilities

WET

- ✓Water Supply Projects

OUR VISION


VISION
L&T shall be a professionally-managed
Indian multinational,
committed to total customer satisfaction
and enhancing shareholder value.
L&T-ites shall be an innovative,
entrepreneurial and empowered team
constantly creating value
and attaining global benchmarks.
L&T shall foster a culture of caring,
trust and continuous learning
while meeting expectations of
employees, stakeholders and society.
LARSEN & TOUBRO

Completed Infrastructure Projects

Al Khodh Interchange

Dualization of Ghala Ansab Road

Al Athaiba Interchange

Darsait – Wadi kabir Flyover

Ongoing Projects

Al Batinah Express way

Mahala-Ghubbrat Al Tam- Ismaiyah Road Project

Dualization of Bid Bid Sur

Our Project

Title : Dualization of Bid Bid Sur Road.

Location :North & South Al Sharqiya.

This project links Bidbid with Sur , via Wilayat Al Qabil, Bidiya, Wadi Bani Khalid and Al Kamil. It consist of 76kms of 6 Lane Asphalt road with 8 Interchanges and 252 no’s Cross drainage structures and is currently in construction phase.

Project Layout on Google Earth Platform

Challenges Encountered

Project being located in the vicinity of Desert, day to day challenges

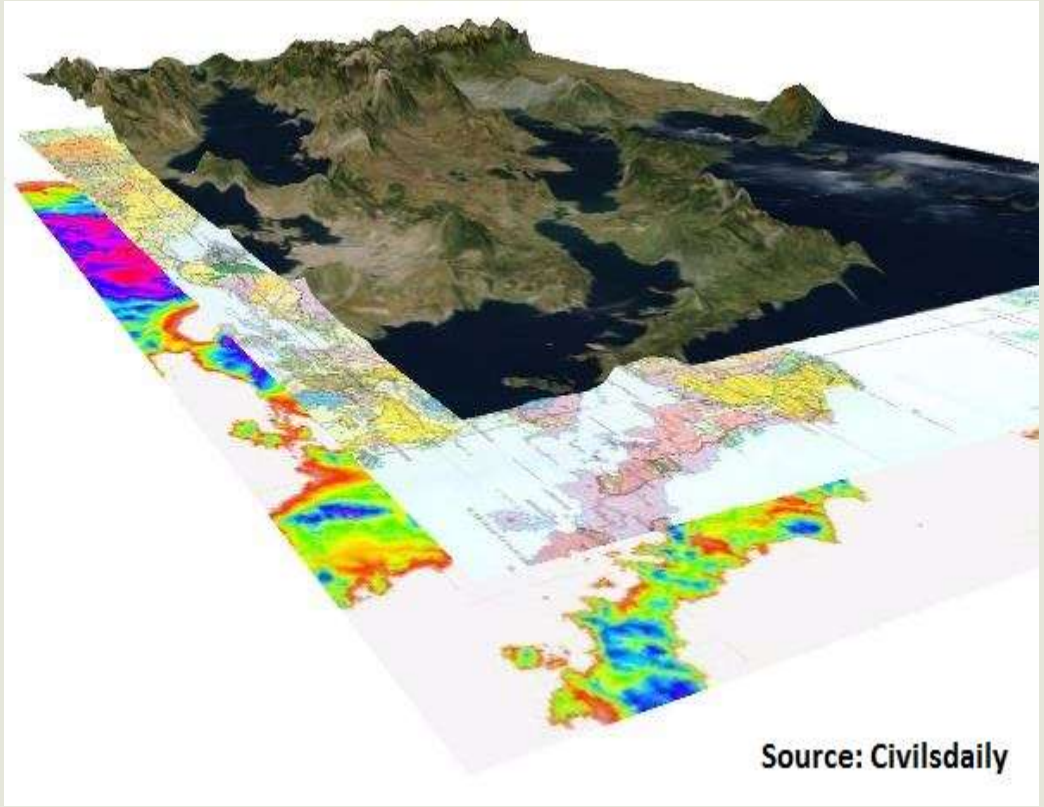
1. Accessing Borrow areas
2. Real time vehicle movement monitoring.
3. Elevation and Density monitoring.
4. Manpower Productivity monitoring.
5. Project Progress monitoring.

Agenda for the day

- Construction is one of the major industries that deal directly with geography/nature for its productivity. Though the type of constructions are varying like Buildings, Factories, Roadways, Railways, Metros, Ports, Power transmission, Solar energy, Water supply, Effluent treatment, Hydro & Nuclear Power generation, etc. are being constructed on, above or below the earth. The unplanned and haphazard production of infrastructure/building construction causes imbalanced and unfriendly relation to environment and this creates a big threat to peace, prosperity, health and quality of human-environment interactive arena [1].
- In this perspective, Geospatial Technology section of L&T Construction, exploring the benefits of GIS at enterprises level through various construction industry related case studies [1] .

Pre construction Stage

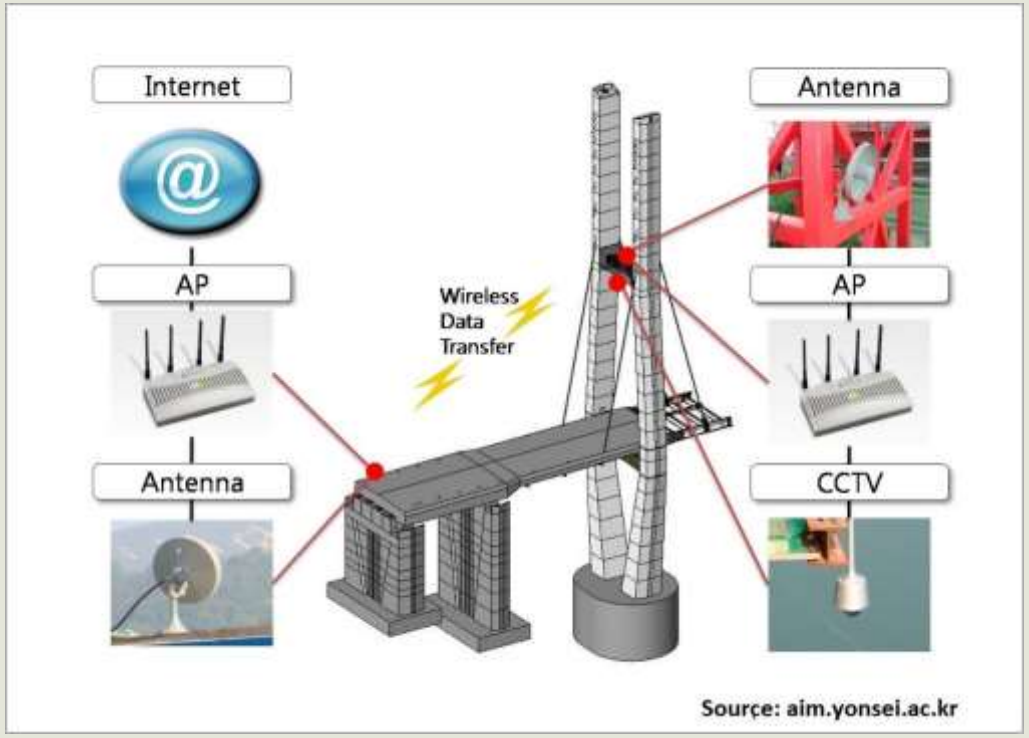
- Location, administrative boundary, existing land use, soil characteristics, geology & geomorphology, climatic & terrain conditions of in and around the site, required built-up area, bill of quantity, manpower, rate and availability of construction materials at nearby locations are some of the spatial & aspatial information that require at the tendering/bidding stage of a construction projects can be easily monitored. [1]
- If preconstruction stage monitoring or Reconnaissance is done , 3D maps of the area can be developed and it gives a broad idea of what needs to be taken care off during construction as it highlights areas of probable issue/danger, areas of probable delays. Effective measures can be taken in advance to minimize the risk or delays
- Some of the advantages are
- Mapping of Existing Habitation
- Ground water levels
- Mapping of existing utilities



Construction Stage

- During construction stage, if implemented these techniques can change the way of progress monitoring. Detailed and Real time monitoring can be done, these techniques reduce errors in reporting.

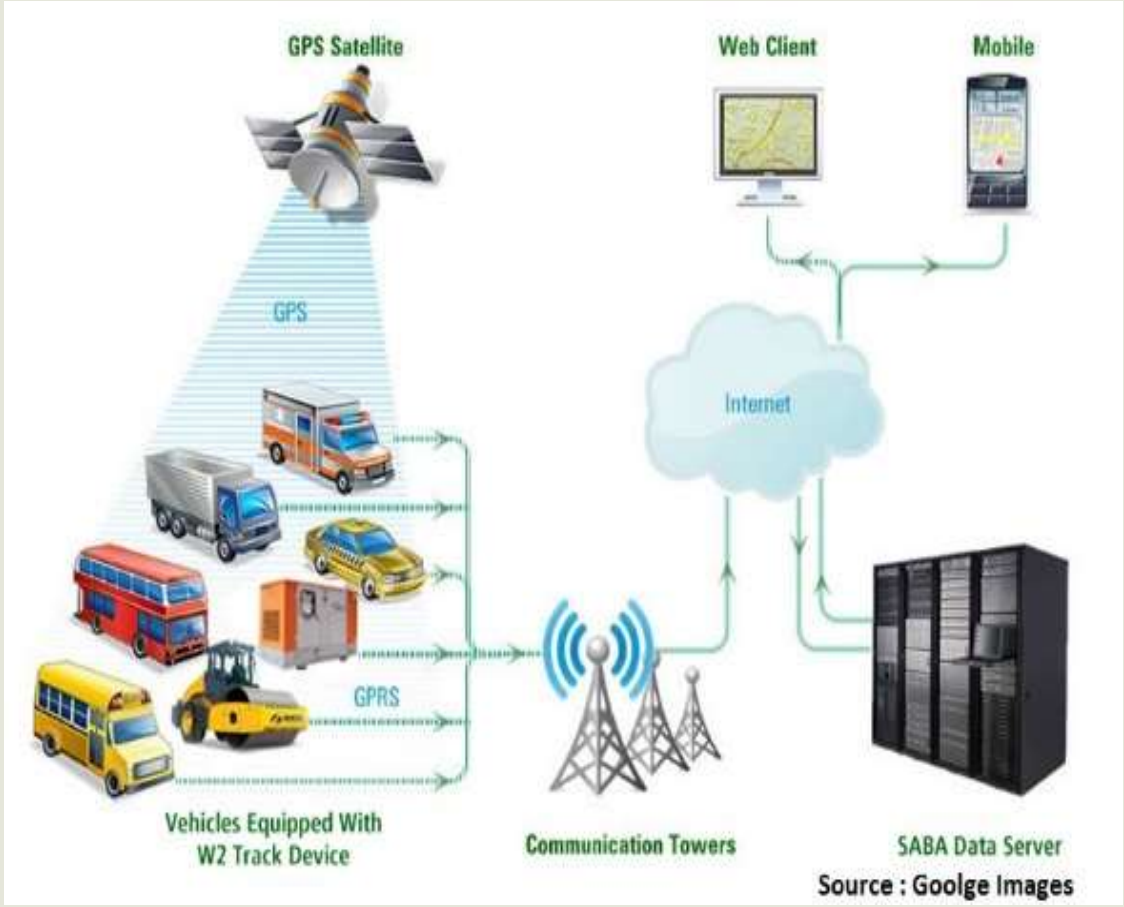
- Representative image for real time monitoring



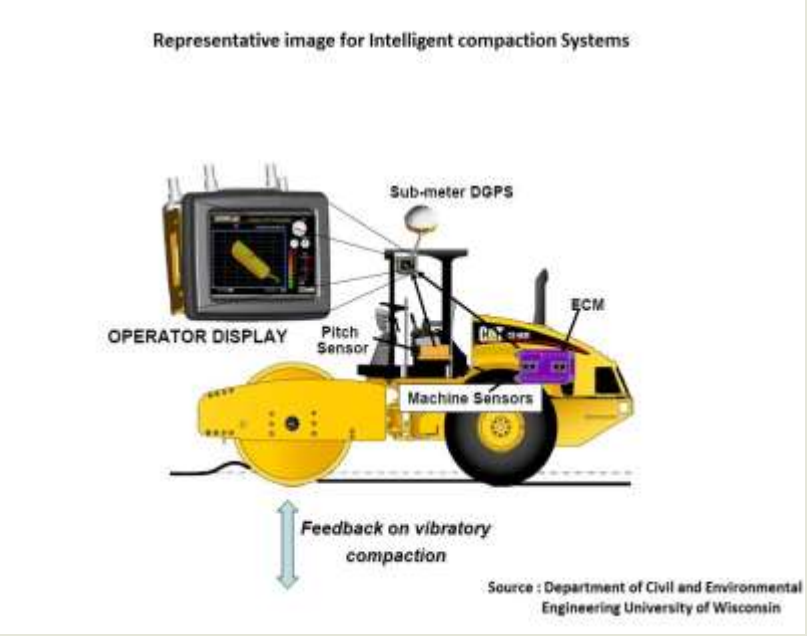
Construction stage …… (2)

- Tracking of Vehicle movement – It is a big challenge to keep a track of vehicles working on the construction site if it's a road project due to length of the project. Vehicles can be fitted with mapping devices which gives the location of the vehicle, real time tracking can be done. (These data can be used during settling of accounts of the vehicle in case of hired vehicles
- Some of the advantages of vehicle monitoring are
- Track vehicle movement in construction site
- Record ide time
- Track breakdown of the vehicles
- Record cycle time

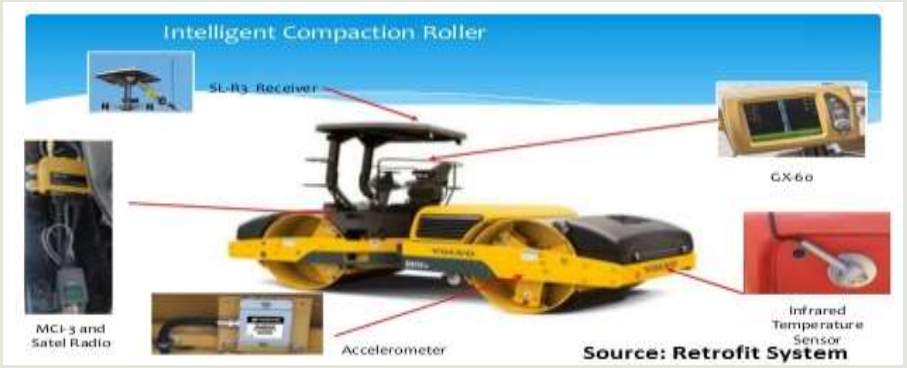
The performance of vehicles can be monitored in real time if this technology is implemented



Construction stage ..... (3)



- Elevation and Density monitoring – One of the biggest challenges in road construction is to maintain levels of the constructed surface. By using intelligent compactors the level of compaction can be evaluated and progress can be enhanced. Construction works can be completed at a faster pace.
- Advantages of monitoring levels are
- Accuracy and quality in construction.
- Completion of work at faster pace.
- Reduce human interference and errors in Controlling Elevations
- Reduction of cycle time in construction. (Construction , testing and inspection can be done simultaneously).



Post Construction stage

Location based database technology of GIS has great extent of ability to effectively manage the assets. Effective as built drawings can be prepared on an interactive platform so that asset management becomes easy for both client and the contractor. Identification of assets, utilities and other constructed areas is made easy. Any damage to the finished product can be monitored real time.

Some of the key advantages are

Maintain data base of the project

Real time Asset management

To conclude in construction industry GIS acts as a blend of Geographic understanding, Management practices, engineering and technology and it reduces unwanted duplication of spatial information among various stages of design, execution and contract.

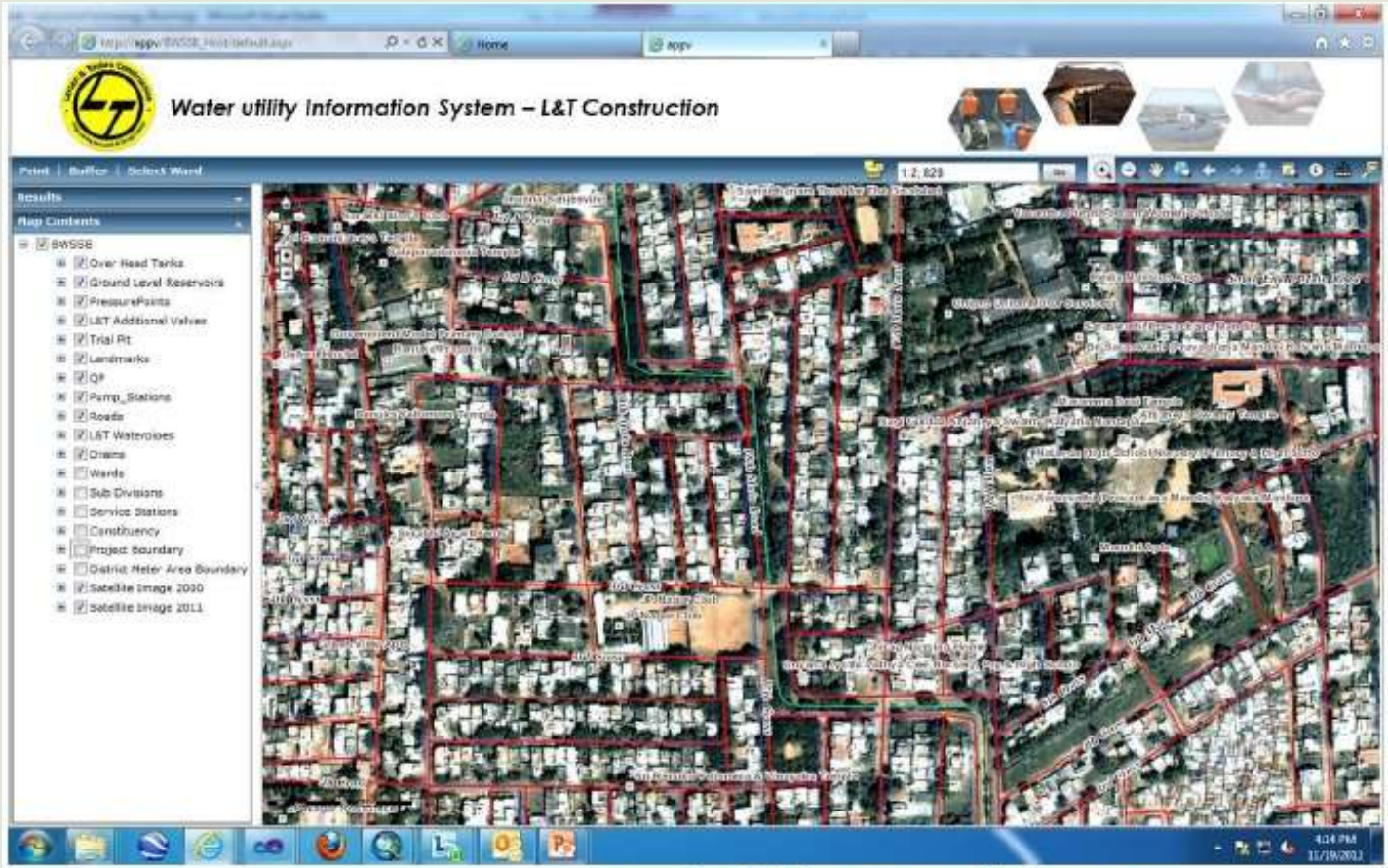
GIS implementation in L&T Construction

Enterprise GIS based water utility information system [1]

Development of GIS system for utility management was done with the help of ESRI.

As a case study a small portion of water utility information was converted in to ESRI ArcGIS Geo Database and information system is developed.

This allows the users to understand spatial relationship of their utility data with the existing geographic features.



Enterprise GIS for water utility system

Signing off

To conclude

In construction industry, GIS acts as a blend of Geographic understanding, Management practices, engineering and technology. It also reduces unwanted duplication of spatial information among various stages of design, execution and contract.

.....Thank You