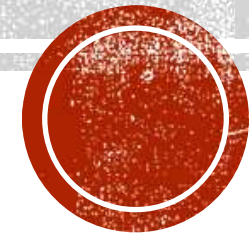


# **INTEGRATION OF ENGINEERING AND GEOSPATIAL TECHNOLOGIES IN TRANSPORTATION SECTOR**



*American roads are good not because  
America is rich , but America is rich because  
American roads are good.*

By JFK Kennedy

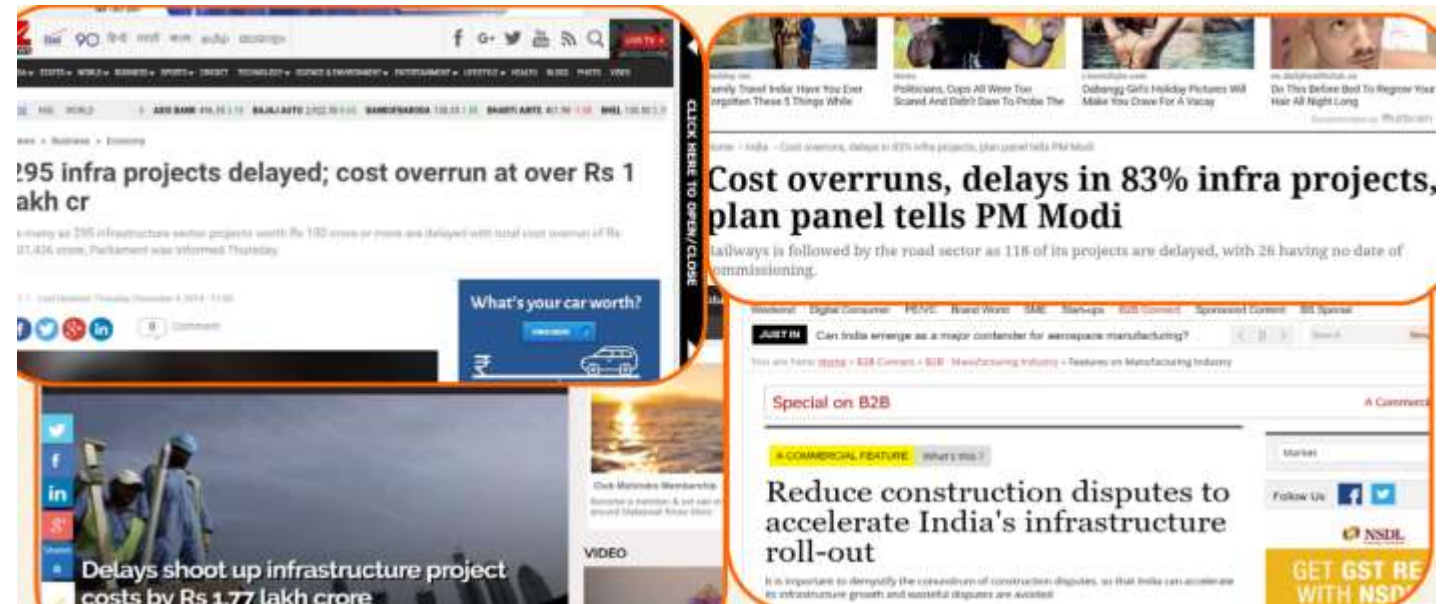


# AGENDA

- Overview on Transportation Sector
- Need for road safety and road maintenance
- Challenges at global level
- Key stats for India
- Solution offered for road authorities in India
- Challenges and offerings
- Credentials in Transport Sector
- About ViaTech



- ❑ Time consuming survey methods
- ❑ Faulty Designs
- ❑ Departmental Clearances
- ❑ Fund Flow management
- ❑ Inter-Departmental Coordination
- ❑ Existing Asset Data



# OVERVIEW ON TRANSPORTATION SECTOR

## Global Investment in Transport Sector

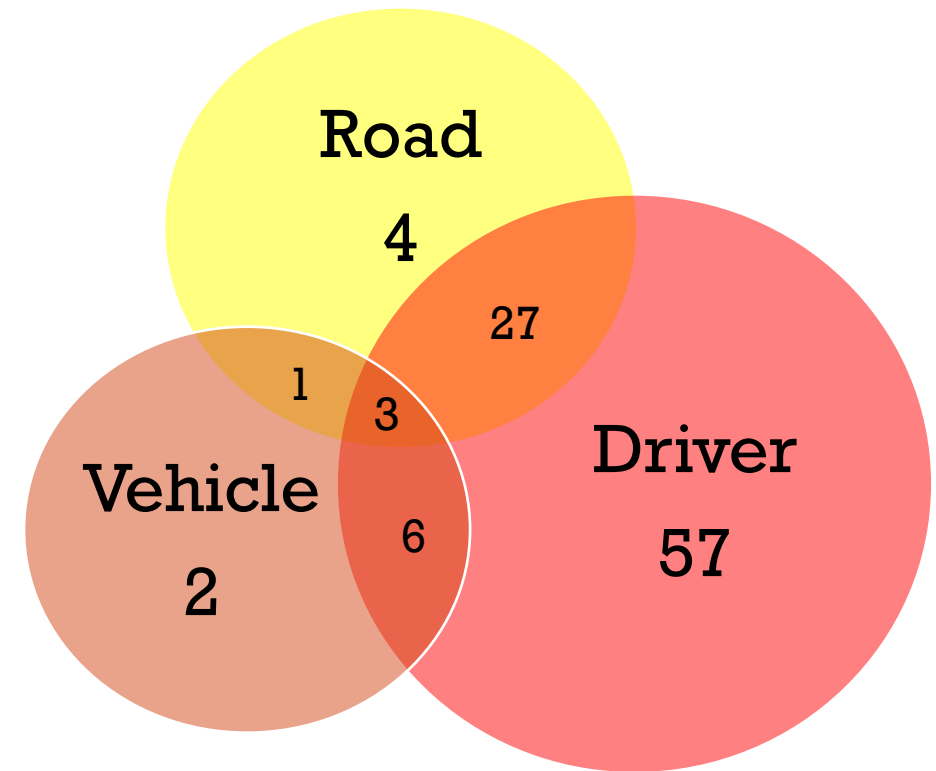
- \$US 3.3 trillion is spent globally on infrastructure projects out of which spending's on highways is around 35%
- Investment in infrastructure in Asia is maximum as compared to other regions
- Ratio of budgets on new infrastructure and maintenance varies as high on 15% in USA to 2% in India
- Transport accounts for about 64% of global oil consumption, 27% of all energy use, and 23% of the world's energy-related CO<sub>2</sub> emissions
- Cities will be home to some 5.4 billion residents by 2050, equivalent to 2/3 of the projected global population. The number of vehicles on the road will double to reach 2 billion by 2050
- In emerging mid-size cities, where most of the new urban dwellers will live, city planners have an opportunity to design sustainable and inclusive transport systems
- As the developing world rapidly urbanizes, there is an opportunity to build safer, cleaner and more efficient transport systems that reduce congestion and pollution and facilitate access to jobs



# REQUIREMENT OF ROAD SAFETY AND ROAD MAINTENANCE

## Key Statistics – Road Safety \*\*

- Over 1.4 million road traffic deaths globally as in 2017
- Average rate of fatality is 17.4 persons per 100,000 people
- Rate of fatality is highest in Africa (26.6) and Lowest in Europe (9.3)
- More than half of the death occurs for venerable road users i.e. Motorcyclists and pedestrians
- Adults aged between 15-49 account to 59% of this death
- Total number of injuries and permanent disability is around 4-5 times this values
- Road Crashes cost most of the countries nearly 3% of there GDP



**Causes of Accidents (%)**



# CHALLENGES AT GLOBAL LEVEL

- Out of 3 factors responsible for accidents, road related factors contributes to around 34% of casualties
- Proper design and maintenance, well designed intersections, visibility and traffic control devices can result in significant improvement in traffic safety
- Road related factor is majorly responsible for difference in rate of fatalities in developed countries (10 per 100000 people) from developing countries (25 per 100000 people)
- In UK investment in road infrastructure program could yield 35% in reduction of road deaths (saving of £6 billion per annum)
- In developed countries, spending's on infrastructure is huge. At such places, there should be proper tool for checking the quality of new construction and working out budgets for maintenance.
- On the same lines, countries where fatalities rates is high and infrastructure spending's are more, one should adopt a system so as to avoid accidents and keep check on its spending's for optimum fund utilization



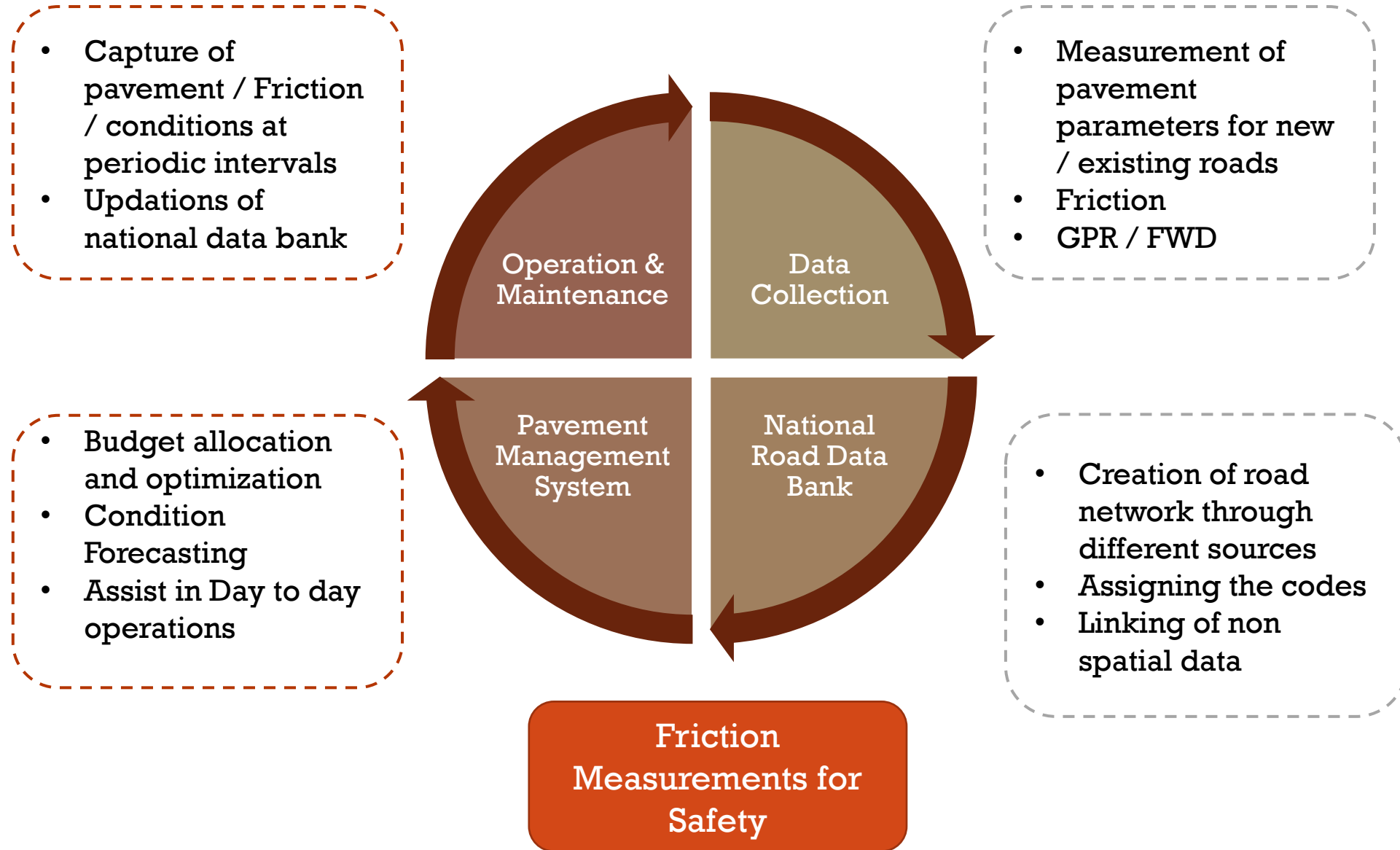
# KEY STATISTICS FOR INDIA

- India has national network of 115,000 R-km, State highways for around 176,000 R-Kms and other roads are around 5million R-kms (includes all types)
- As per MORTH's statistics, on road there are daily 413 accidental deaths leading to 150,000 death in a year.
- As per the MORTH 's report, bad road conditions are one of the major causes of road accidents that leads to death.
- As per study conducted by UNESCAP, India's GDP takes a 3% hit every year due to road accidents, equivalent to over \$ 78 billion US in value terms (GDP for India 2017was around \$ 2.6 Trillion US)
- Government of India allocated Rs 71,000 crore (US\$ 10.97 billion) for development of national highways across the country.
- Government of India is coming up with following schemes for development of an efficient road network across India like Bharatmala ( \$ 7.5 billion US), Pradhan Mantri Gramin Sadak Yojana (\$ 1.26 billion US) for 2018-2021
- On similar lines there are huge projects initiated at state level too for development of infrastructure





# SOLUTION OFFERED TO THE ROAD AUTHORITY



# SOLUTION OFFERED – DATA COLLECTION



Pavement Scanner (ViaPPS)



Friction Device (ViaFriction)



Ground Penetrating Radar (GPR)



Components of ViaPPS



Components of ViaFriction



Falling Weight Deflectometer (FWD)

# SOLUTION OFFERED – DELIVERABLES (DATA COLLECTION)

- Longitudinal and transversal profile
- Rut depth, rut area and rut area volume
- Crossfall & Crossfall Requirement, curve radius
- Longitudinal deflection/Bumps
- IRI and MPD
- Width of the lane Bad joints of the asphalt
- Crack parameters and accident investigation
- Tunnel/Bridge profile including height
- 3D data to external standard format such as xyzi/las/laz
- Friction values measurement
- WEB interface and 360 photo integration



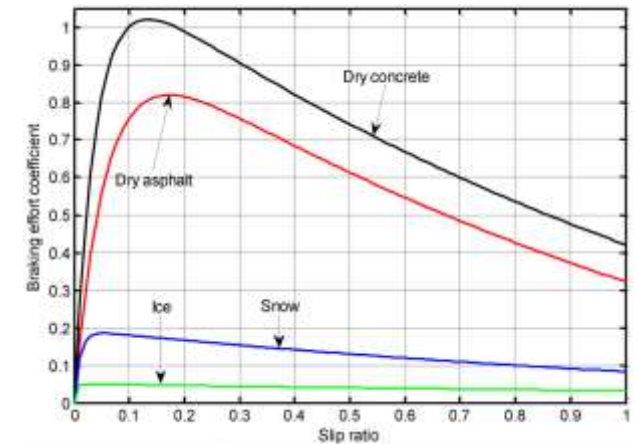
3D Point Cloud Data



Rut Depth Analyzer



Generation of Maps & Reports



Variable Slip Measurement



# **SOLUTION OFFERED – CREATION OF NATIONAL ROAD DATA BANK**

- Creating a road database by mapping of all the existing Road Network through latest technology satellite / aerial / UAV / surveys
- Mapping of road assets through field survey
- Assignment of existing codes from highway authorities
- Dynamic segmentation of road network by chainage and standards adopted by authorities
- Linking of non spatial data with spatial data
- Migrating to Pavement Management System (PMS) application
- Continuous updating of network with field surveys
- Data from GPR and FWD surveys



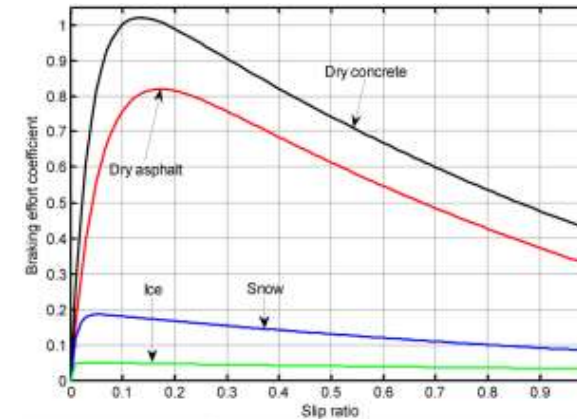
# **SOLUTION OFFERED – PAVEMENT MANAGEMENT SYSTEM**

- Use multiple what-if scenarios to check for budget allocation to maximize return on investment (ROI).
- Align projects across multiple years to create efficient work plans that reduce effort and save money.
- Create optimal work plans using predictive modeling to determine the best time to apply a preventive treatment that keeps pavement in good repair.
- Generate interactive reports that communicate the effects of your investment decisions and the performance of your network against various measures.
- Manage your day-to-day operations with greater efficiencies, both in the office and in the field, using Operations Management
- Streamline workflows for inventory, inspections, work orders, scheduling, recording, and reporting
- Make better decisions to maintain, preserve, rehabilitate, and replace bridges and other structures.



# FRICITION – MAIN COMPONENTS AND DELIVERABLES

- Can take vertical load more than 100 kg
- Can measure high friction surface at 20 km / hour
- Free floating vertical load, rugged design, easy and accurate distance calibration
- Can adjust slip percentage 1-75% within 30 seconds
- Low maintenance and can keep calibration for years
- Excellent repeatability
- Used ASTM 1551 measuring tire
- CEN TS 15901 – 14 approved



**Variable Slip Measurement**



**ViaFriction+ViaPhoto+GPS+Web**



# CHALLENGES & OFFERINGS

- Need Fast and accurate Mapping of road pavement and assets
  - **Can Map around 300 kms per day in single vehicle**
- Survey challenges in heavy traffic
  - **Mapping can be done at less peak hours / night time**
- Different surveys needed for pavement conditions, road assets and safety parameters
  - **Can be carried out together in single combined vehicle**
- Data available in different patches
  - **Creation of National road data bank ensures data to be present in centralized system**
- Monitoring of construction quality and budgeting is person dependent (traditional methods)
  - **Process to automated by introducing transparency in the system**
- Presentation of financial losses
  - **Road condition forecasting to be done by PMS**
- System maintenance
  - **Entire operations can be maintained till handholding**
- Road safety in lieu of increased average speed on highways
  - **Period measurement of friction parameters highlights problematic patches which are suspectable for skidding**



# COMPANY CREDENTIALS

- Inhouse developed technology for pavement and friction scanning
- Method included in Norwegian Public Road Authority Manual for its application
- Entire road maintenance for Norway is done by ViaTech's Solution
- Using this technology NPRA measures around 100,000 R-km of road each annum since last 10 years
- Software can be upgraded as per local requirements (upgraded each year)
- In Norway budget of \$US 800m is approved based on reports generated by this systems (cost of using this systems (including operations) < 0.5% of budget)
- Have sold units in various countries such as Norway, Denmark, Poland, Sweden, Italy, Mexico, India, Philippians etc.





# ABOUT VIATECH

## The Journey So Far....

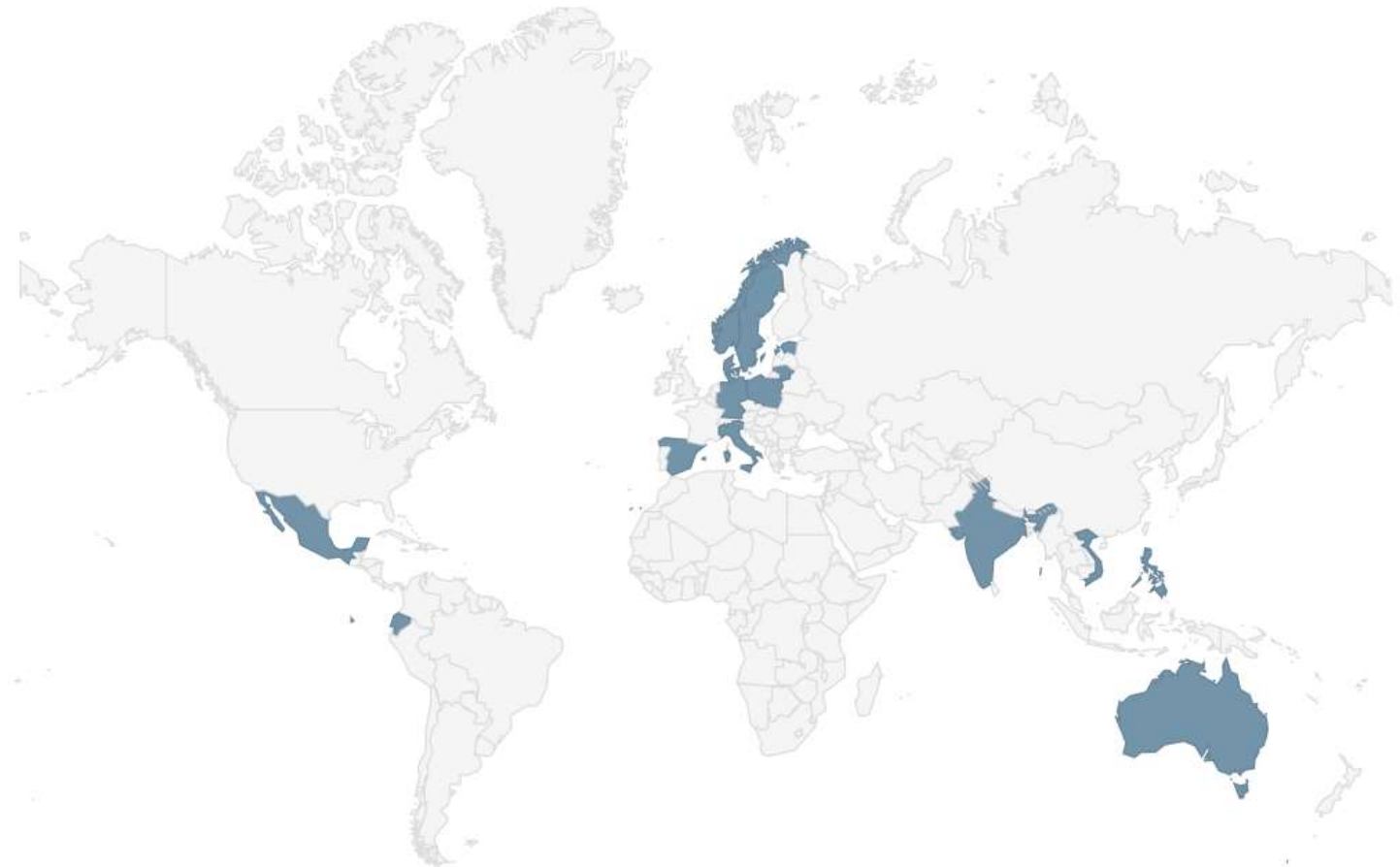
Founded in 1997

Norwegian Company based  
out of Kongsberg

An employees owned  
company

Having more than 150+ year  
of experience in R&D

Approved CEN/TS -15901-14



**Global Presence**



# ABOUT VIATECH



## Solution Range

Laser Scan Technology
Control Systems
Design of Electronics
Mathematical Modelling
Embedded Systems
Software Development

## Industry Spread

Transportation
Defense
Maritime
Paper / Process Control Systems
Airports
Phone Communication

## Partner Network

Asia	India
	Philippines
	Thailand
	Vietnam
Europe	UAE
	Poland
	United Kingdom
South America	Spain
	Mexico



**THANKS...**

**By**

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