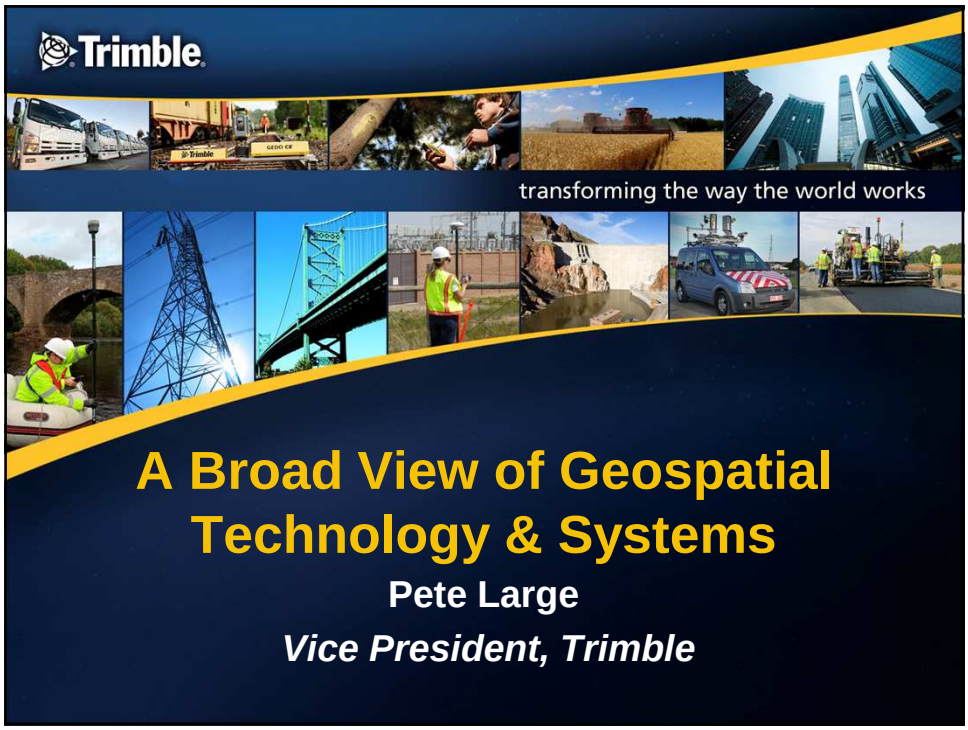
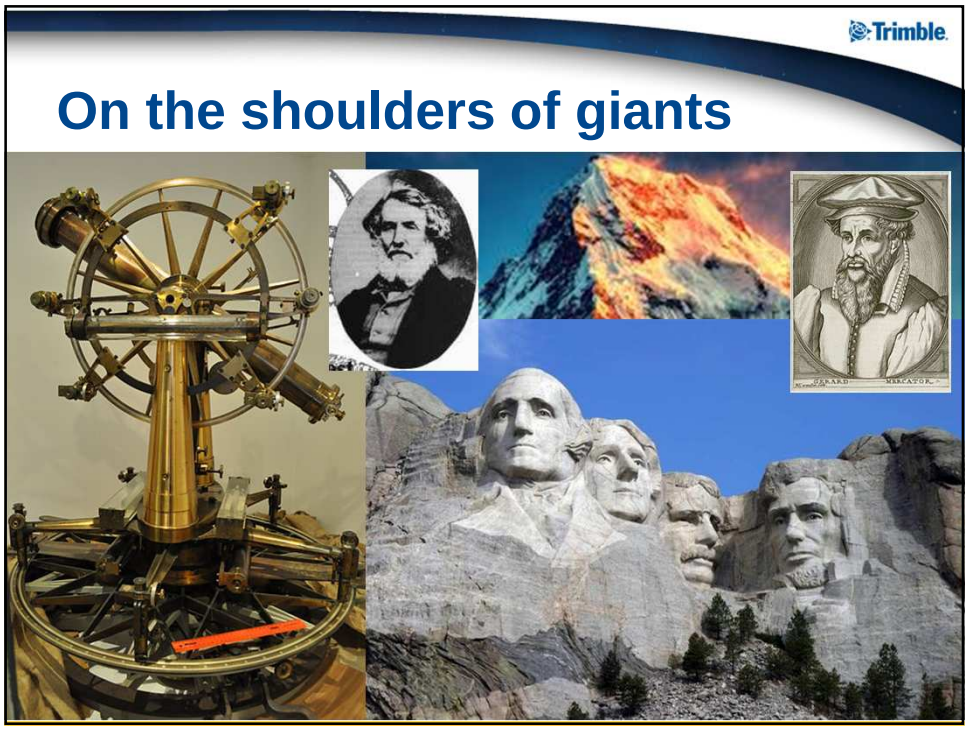
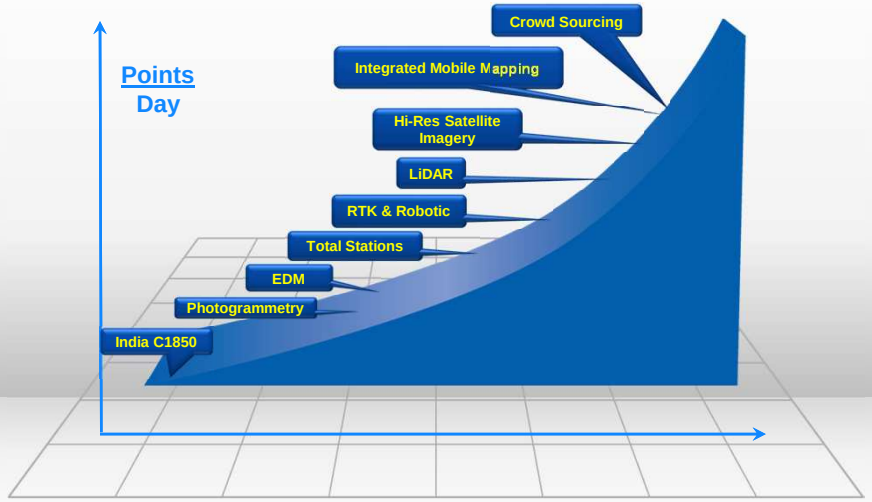
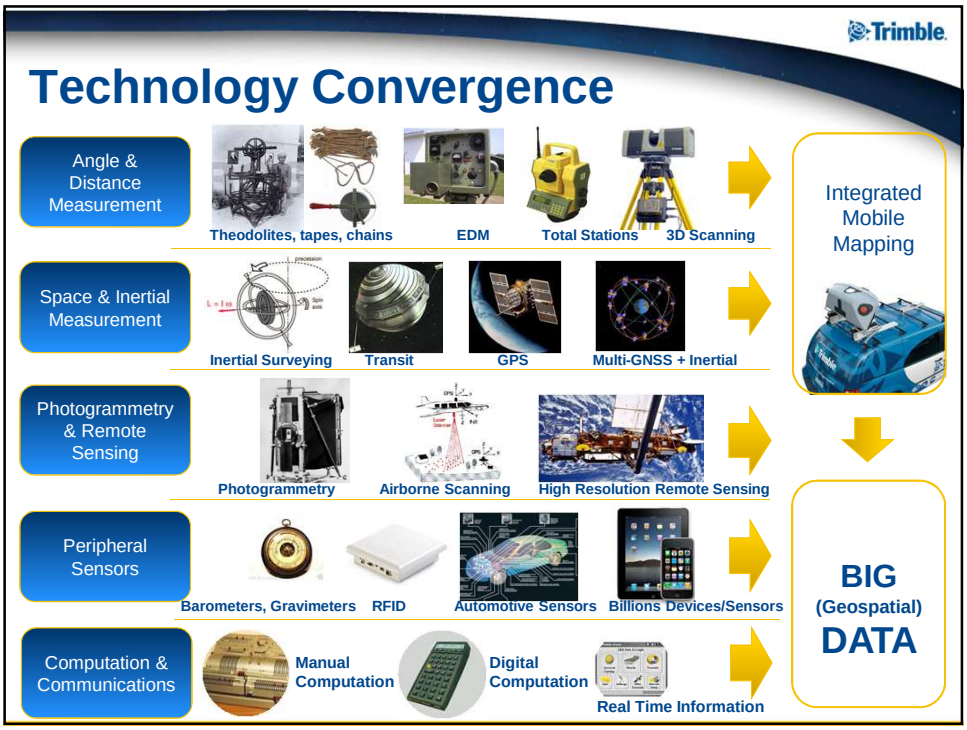

Trimble
transforming the way the world works
A Broad View of Geospatial Technology & Systems
Pete Large
Vice President, Trimble


Trimble
On the shoulders of giants

Since their time, our ability to generate geospatial information has grown exponentially

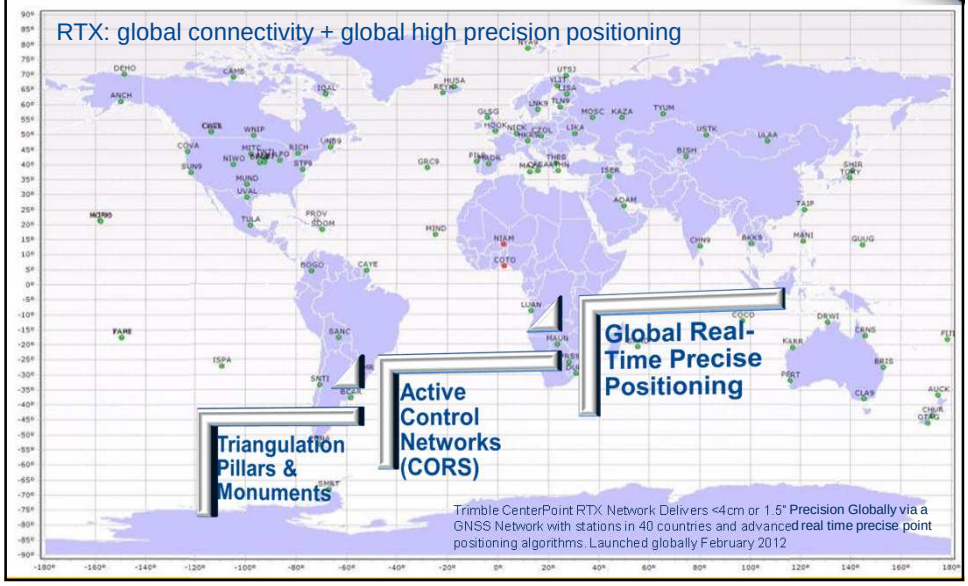


4 Billion Data Points Per Hour


Trimble
Technology Convergence
Angle & Distance Measurement
Theodolites, tapes, chains
EDM
Total Stations
3D Scanning
Space & Inertial Measurement
Inertial Surveying
Transit
GPS
Multi-GNSS + Inertial
Photogrammetry & Remote Sensing
Photogrammetry
Airborne Scanning
High Resolution Remote Sensing
Peripheral Sensors
Barometers, Gravimeters
RFID
Automotive Sensors
Billions Devices/Sensors
Computation & Communications
Manual Computation
Digital Computation
Real Time Information
Integrated Mobile Mapping
BIG (Geospatial) DATA

Trimble
Geospatial information has evolved from paper maps, to GIS, to 3D virtual models of the world, accessible to billions.
Paper Maps
Large Scale
Small Scale
Map Makers
Map Users
GIS
Digital Maps coupled to a database
GIS DC
Map Users
Virtual Worlds
Accurate 3D in the cloud
Billions of Data Users

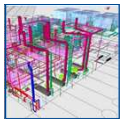
GNSS Infrastructure provides a unified framework for high precision positioning



GNSS infrastructure and geospatial information are transforming how work is done across a range of public and private sector activities, globally

Agriculture

Heavy Civil Construction


Construction BIM

Cadastral & Geospatial

Transportation & Logistics

Rail

Environmental & Waste

Water Utilities

Electric Utilities & Communications

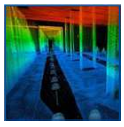
Intelligent Transportation

Forestry

Field Service

Oil & Gas

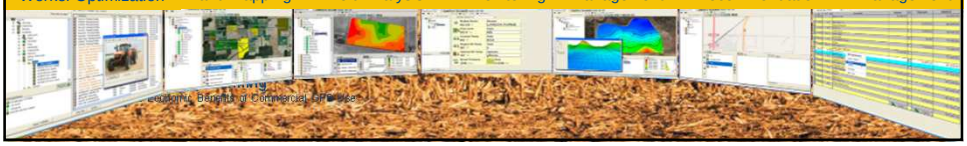
Consumer Devices


Indoor Mapping & Virtual Worlds

Geospatial technology is transforming the work of agriculture

Precision agriculture enables more informed decision making, leading to higher machine utilization, lower seed, fuel and chemical costs, improved yield and profitability, reduced environmental impact.

Machine and Worker Optimization | Planning and Mapping | Prescription and Yield Analysis | Asset Monitoring | Topographic Management | Productivity Recommendation | Financial Management

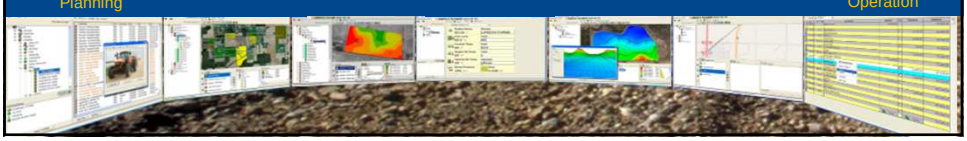


Geospatial technology is transforming work in civil engineering

Enhanced information, decision making and control across the entire project lifecycle, generating benefits including:

- **Faster Completion**
- **Reduced Fuel, Re-work, Labor**
- **Enhanced Worker Safety**
- **Reduced Environmental Impact**

Feasibility and Planning | Survey | Design | Estimation | Earthworks | Construction | Maintenance and Operation



Geospatial technology is transforming how buildings are designed, built and operated

Building Information Models (BIM) and advanced site technologies are deployed across the entire design-build-operate lifecycle, generating results including:

- Faster Completion
- Reduced Re-work, Labor
- Improved Quality, Collaboration & Data Flow
- Improved Asset & Facility Lifecycle Management

Geospatial technology is transforming how land is administered and managed

Geospatial technology is transforming all modes of transportation

Geospatial technology is transforming how our natural resource and utility demands are met

Positioning Systems for Oil & Gas Exploration and Production, Mining.

Marine Construction & BIM for Offshore Steel

Surveying & Mapping Systems for Pipeline, Transmission & Distribution Systems

Alignment Planning for Transmission Systems

Utility Incident & Outage Management Systems

GPS Network Timing & Synchronization

Asset, Work & Fleet Management

Geospatial technology is changing the work of government

CITIZENS & CONSUMERS

– GIS Data Users

-Smart Phones

DBs

Enterprise Application

GIS Server

MOBILE FIELD CREWS & FLEETS

--Data Collection / Validation

-Work & Incident Management

-Asset Management

- Fleet tracking & Routing

CONTRACTORS – Intelligent Machines

Geospatial technology is transforming our understanding of the planet and its natural hazards and processes

Seismic activity monitoring in New Zealand

Earth quake relief in China

Geospatial technology is changing the work of all of us

What does this mean for the profession?

Historical Roles

Measurement & Data Collection → **Interpretation & Quality Control**

Instrumental precision
Meticulous observation & calculation

Accuracy, Credibility, Reliability

Emerging Roles

Interpretation & Quality Control → **Analysis, Modeling & Applications**

Establishing geospatial context
Managing quality, integrity, complexity
Big data management
Providing answers, solving problems

Accuracy, Credibility, Reliability,

Geospatial infrastructure, technology and information are enablers which help us to rise to some of humanity's biggest challenges

- Feeding a growing population
- Securing land tenure for the majority
- Meeting global demands for natural resources – energy, water, power, materials
- Enhancing public safety & security
- Improving warnings of, and recovery from, natural disasters
- Supporting economic growth and recovery
- Providing places for a growing population to live, work, learn and receive health care
- Connecting the Global Village through transportation, communication and access to the power of place