An Industry Perspective

Bryn Fosburgh

Vice President

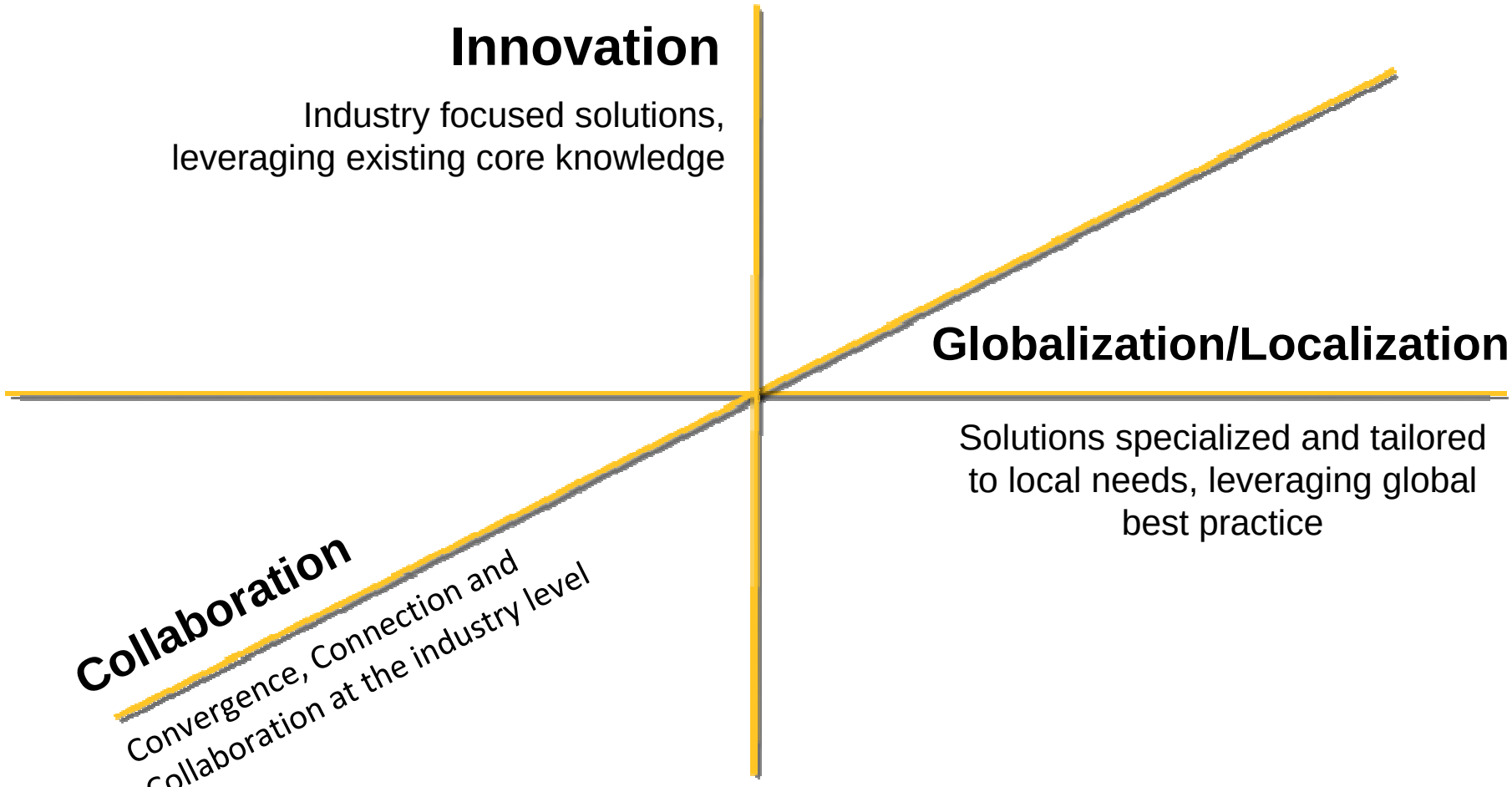
Trimble

Who are we?

- Professionals & Consultants
- Geospatial Professionals working at or with:
  - AEC Consultants
  - Transportation Departments
  - Construction Contractors
  - Railway companies
  - Mining companies
  - Utility companies
  - Owner/Operators

Trimble

New World Challenges & Opportunities



Geospatial Data has evolved from paper maps, to GIS – and now toward 3D virtual models of our world.

Paper Maps

Large Scale
Small Scale

Geodetic Control
Cartography
Paper Map Users

GIS

Digital Maps coupled to a database

Active Control
GIS & Digital Maps
Data Users

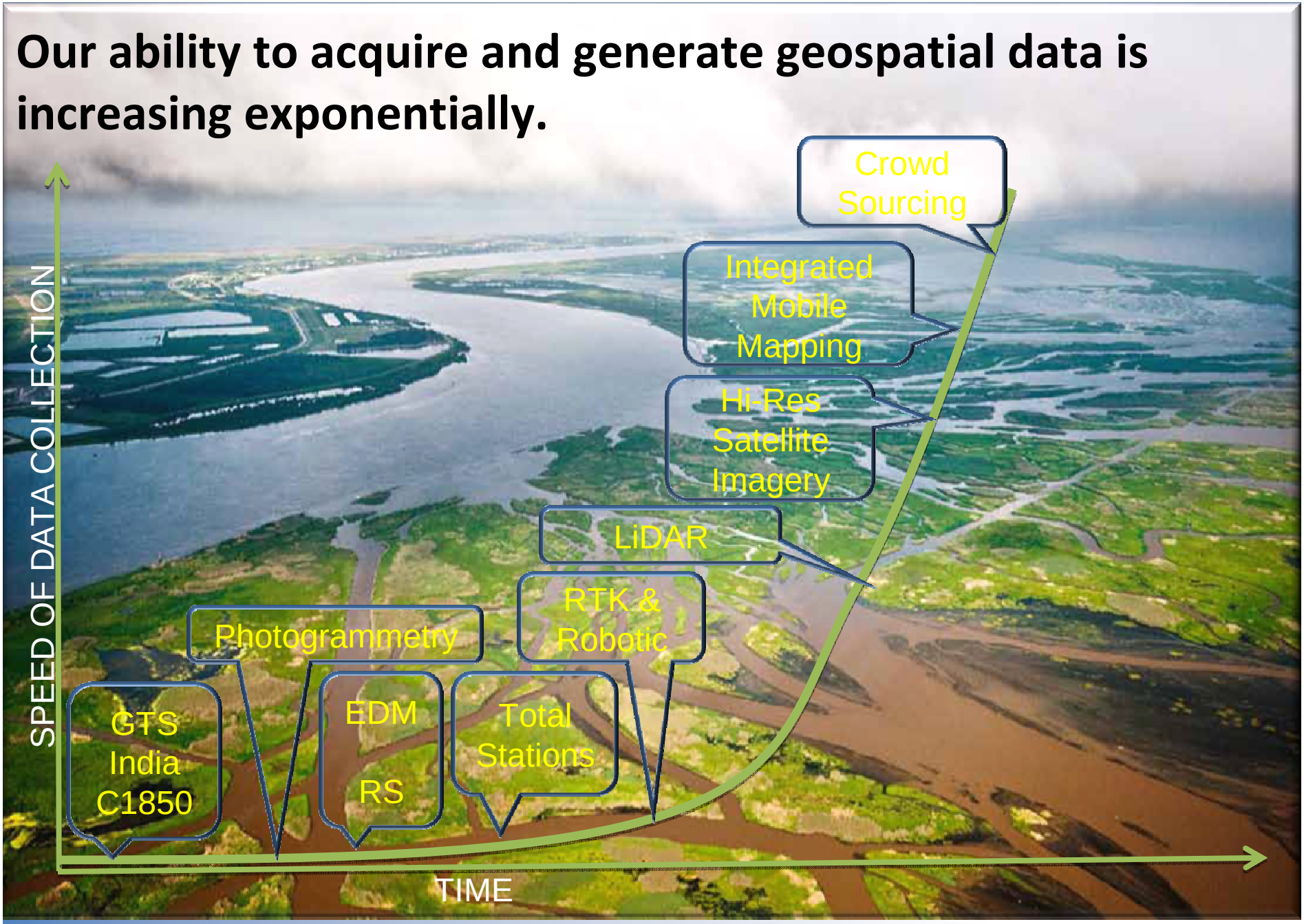
Virtual Worlds

Accurate 3D in 'the cloud'

CM Everywhere
Mass usage and contribution

Trimble

Our ability to acquire and generate geospatial data is increasing exponentially.



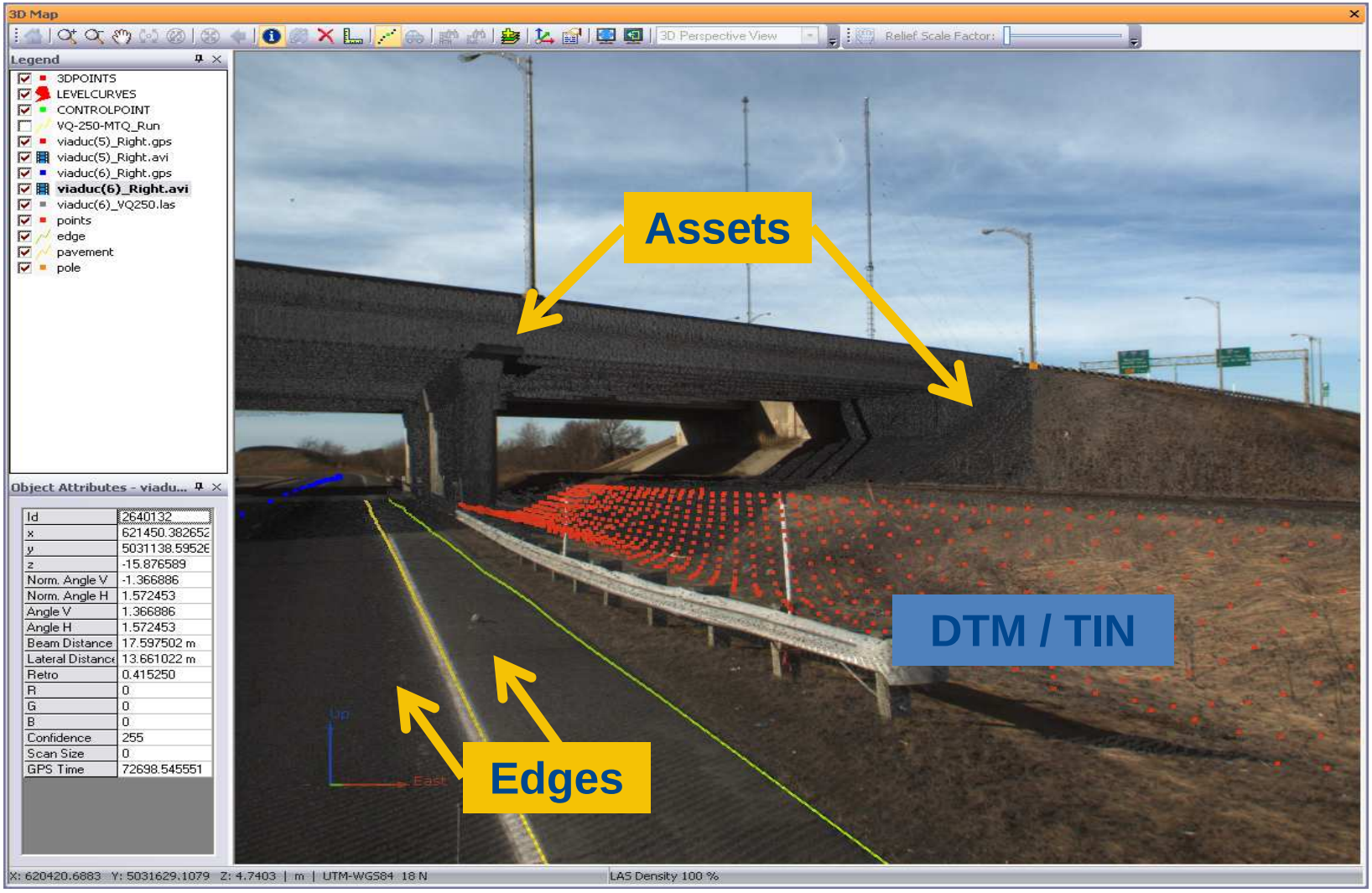
Trimble

Integrated technologies that can collect 216 billion data points per hour will begin to commoditize positioning

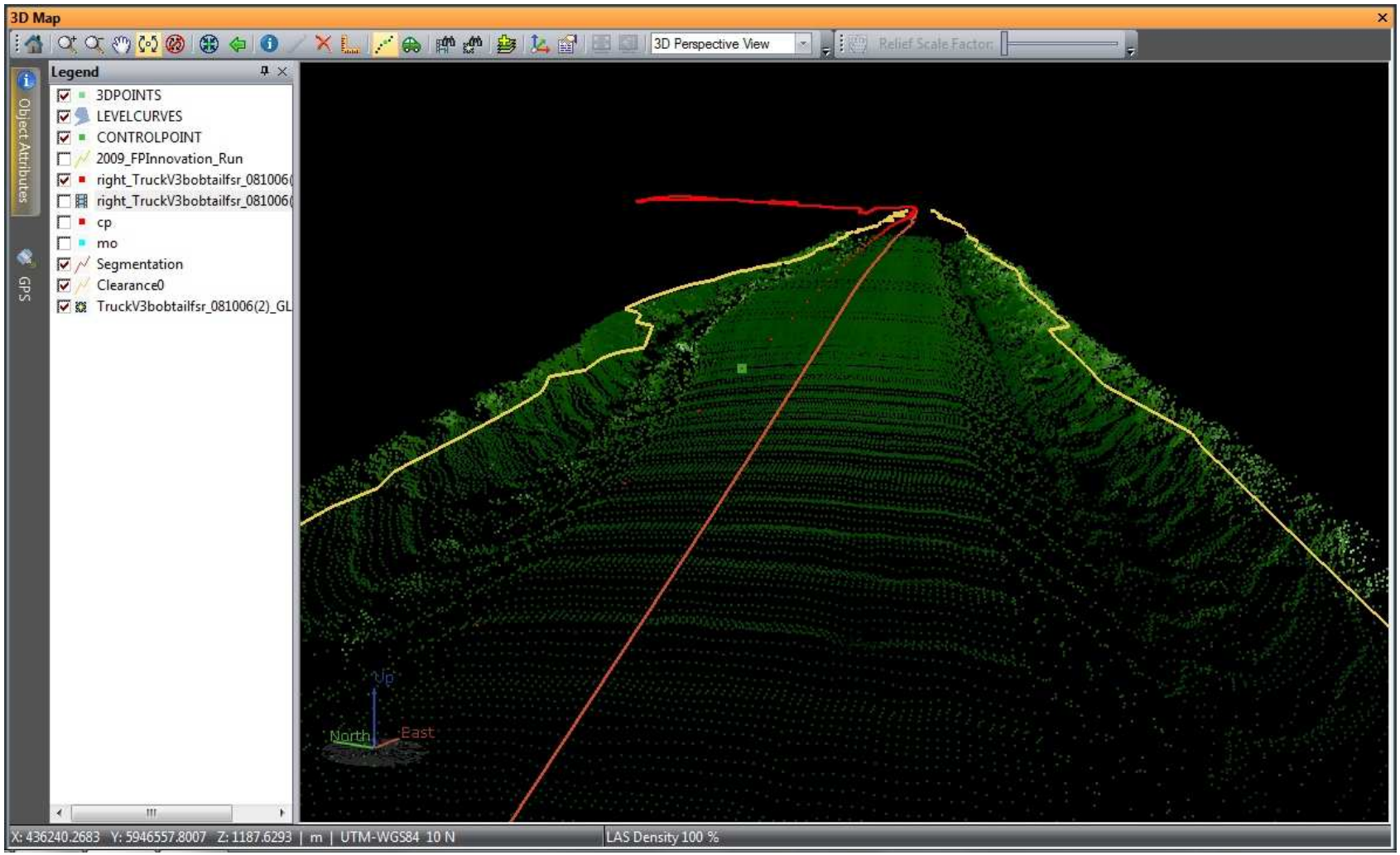
- Typical system
  - 360 deg laser scanners
  - 5 megapixel cameras
- ~60 million meas. & pixels per sec @ 50 mph
- ~216 billion in a single hour

Trimble

and gather features rapidly as well



delivering accurate spatial data fast …



Trimble

Rapid data collection is not just for outdoors

- The technology now exists to map our world in 3D to cm level accuracy, from space, air, land and inside buildings.

Trimble

...which create virtual 3D Worlds for design, security, and facilities management

THE TIMMS APPLIANCE

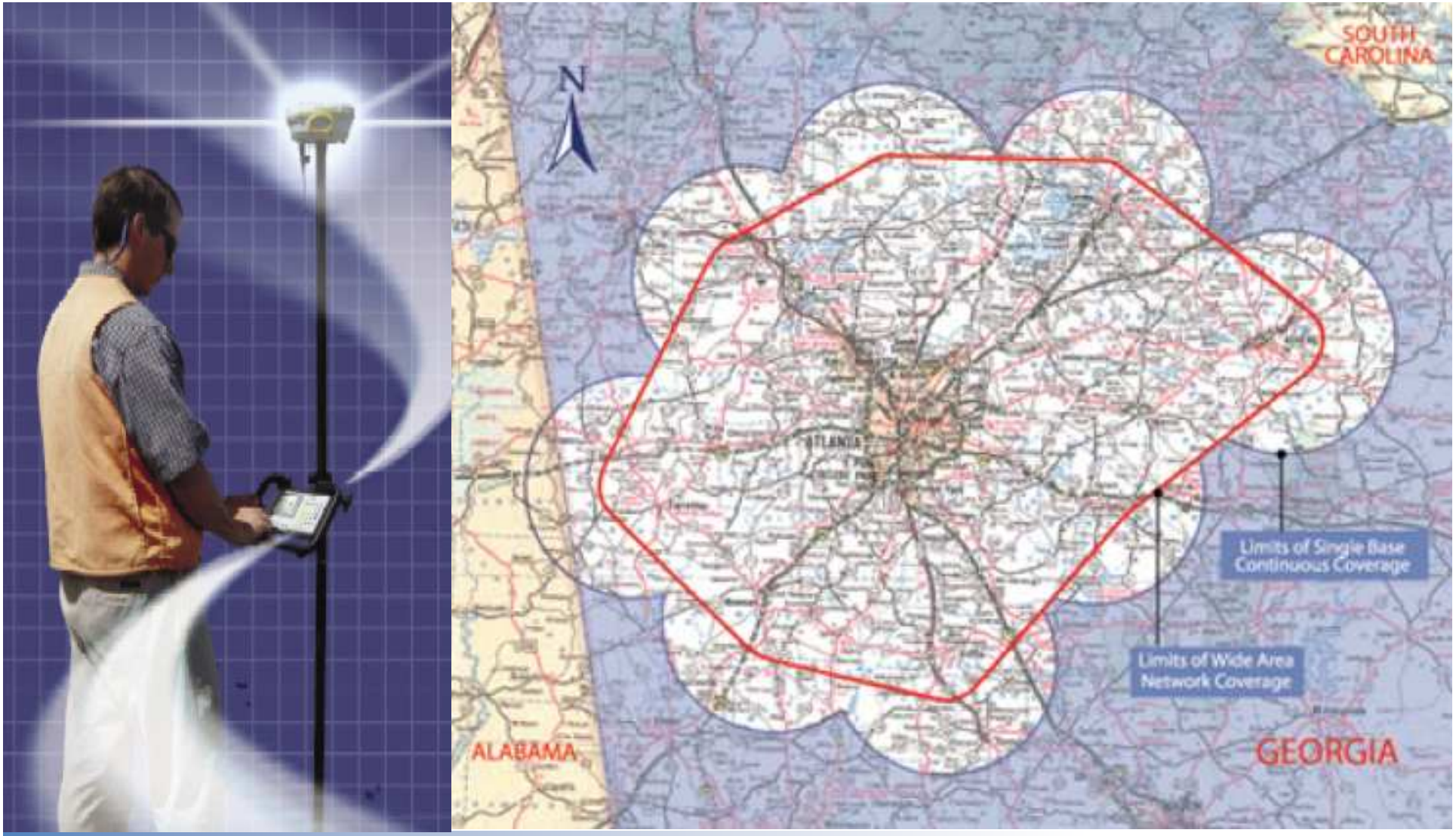
Trimble

Construction Workflow Automation: Technology -> Compelling Economics -> Policy

Trimble

Virtual Reference Station Infrastructure

Technology -> Compelling Economics -> Policy



Trimble

Global Initiatives

A case where technology and economics are ahead of policy.

An approach to formalizing land rights of the world's poor, led by the private-sector in partnership with non-profit orgs.

2 years after commissioning 75000 landholders are holding title in Benin

National policies need to evolve.

Partnered Organizations

Trimble CIDG ILD Opportunity International GIVING THE POOR A WORKING CHANCE

ESRI SAT SINAPI ABA TRUST LOSAMILLS SCI CLINTON GLOBAL INITIATIVE

Trimble

$50B-$60B is spent each year to collect, analyze and maintain Geospatial data *(IDC)*

Paper Maps
Large Scale
Small Scale
Paper Forms

Map Makers
Map Users

Digital Maps & GIS

GIS DC
Map Users

Spatially Enabled Databases & 'Virtual Earths'

Data Users
Operations

2.5M GIS software users; tens of millions of potential GIS data users – many are mobile

21 Years Serving the GIS Industry

1989	•First GPS system designed for GIS Field Data Collection
1995	•First plug-and-play GPS sensor for laptops and PDAs
1995	•First pen-based GIS data collector
1996	•First real-time GPS/GIS system1995
2002	•First Windows® CE device with integrated GPS
2005	•First Windows Mobile® device with subfoot GPS
2008	•First GIS data collection system with decimeter GNSS

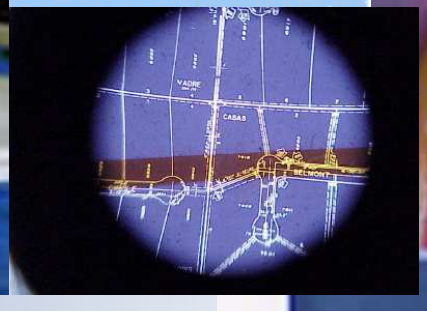
$50Bn spent annually but in many parts of the World it is still paper based

JOB CARD #
ISSUE DATE: 5/23/07
REQUEST DATE:
ASSIGNED TO: Crew
ISSUE TIME:
REQUEST TIME:
CUSTOMER NAME:
ADDRESS: 900 & 1000 Blk Westminster
PHONE:
WORK PHONE:
LOCTN/CUST ID:

CHECK ALL BELOW THAT APPLY:

WATER DIVISION		SEWER DIVISION	
___ B-BOX LEAK	___ REPAIR SERVICE	___ ADJUST MANHOLE/BASIN	___ REPAIR MANHOLE
___ BROKEN MAIN	___ REPAIR HYDRANT	___ CAVE-IN SEWER	___ REPAIR MANHOLE/BASIN
___ DIG BOX	___ REPAIR VALVE	___ CLEAN CULVERT	___ REPAIR TILE
___ FLUSH HYDRANT	___ REPLACE BOX CAP	___ DYE TEST	___ REPAIR VALVE
___ LOCATE BOX	___ RUSTY WATER	___ FILL TRENCHES	___ TRACE SEWER LATERAL
___ LOCATE MAIN			___ SEWER BACK-UP
___ LOCATE SERVICE			___ VACALL CATCH BASIN
___ LOW PRESSURE			
___ OTHER			

JULIE #/DIG #
S: Done 5/23/07
COMMENTS:



$50Bn spent annually but inaccurate base data still exists

Connectivity of the field with the office is becoming more common place enabling more people of all skill sets to be able to collect data

JOB CARD # | ISSUE DATE: 5/23/07 | REQUEST DATE:
ASSIGNED TO: Crew | ISSUE TIME: | REQUEST TIME:
CUSTOMER NAME:
ADDRESS: 900 & 1000 Blk Westminster
PHONE: | WORK PHONE: | LOCTN/CUST ID:

CHECK ALL BELOW THAT APPLY:

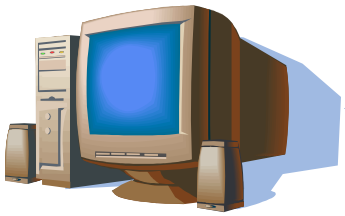
WATER DIVISION		SEWER DIVISION	
___ B-BOX LEAK	___ REPAIR SERVICE	___ ADJUST MANHOLE/BASIN	___ REPAIR MANHOLE
___ BROKEN MAIN	___ REPAIR HYDRANT	___ CAVE-IN SEWER	___ REPAIR MANHOLE/BASIN
___ DIG BOX	___ REPAIR VALVE	___ CLEAN CULVERT	___ REPAIR TILE
___ FLUSH HYDRANT	___ REPLACE BOX CAP	___ DYE TEST	___ REPAIR VALVE
___ LOCATE BOX	___ RUSTY WATER	___ FILL TRENCHES	___ TRACE SEWER LATERAL
___ LOCATE MAIN	___ TURN OFF	___ JET SEWER	___ SEWER BACK-UP
___ LOCATE SERVICE	___ TURN ON	___ FLOODED STREET	___ VACALL CATCH BASIN
___ LOW PRESSURE			
___ OTHER		X OTHER Smoke Test	

JULIE #/DIG #: | MEASUREMENTS: Done 5/23/07

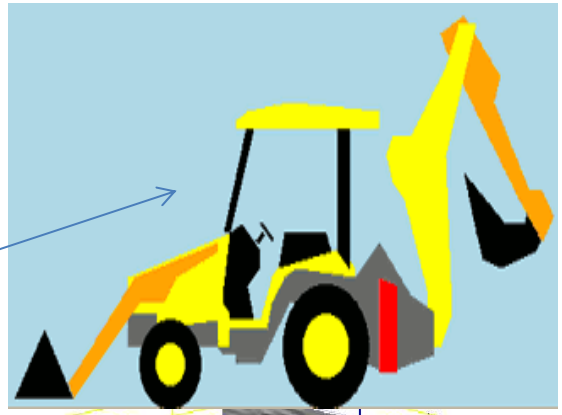
COMMENTS:

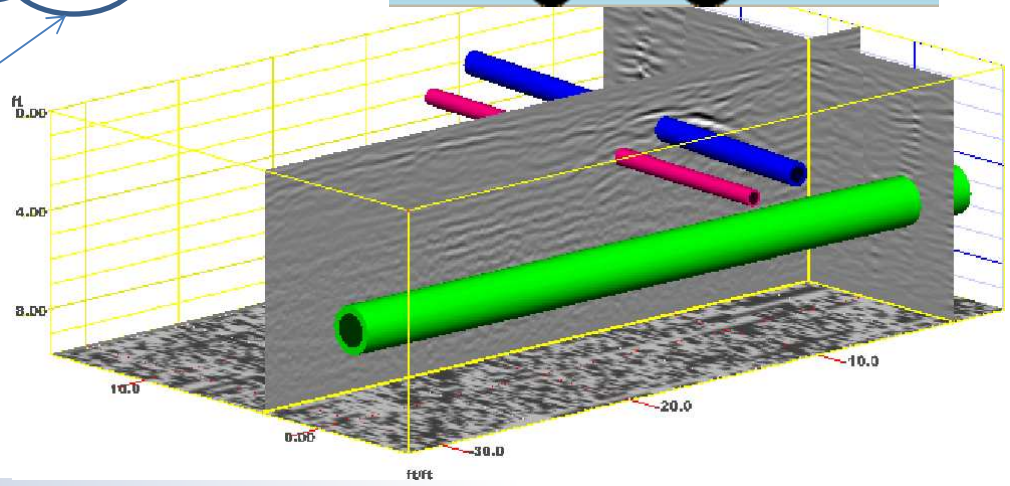
The Buried Asset Problem: One of Technology, Quality, Economics & Policy.

- Regulatory environment & policy
- Quality of data, and quality meta-data
- Availability of data



Connected Community





Trimble

eRespond: Crowdsourcing at work in the Smart Grid.

Trimble

Connecting Geospatial data to Stakeholders improves productivity

CITIZENS & CONSUMERS

– GIS Data Users

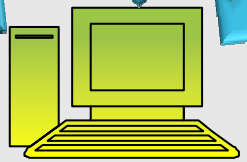
-Smart Meters

- A source of data

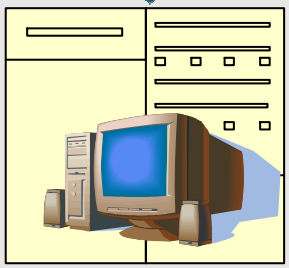
MANAGEMENT

Dashboards & Reports

DBs



Enterprise Application



GIS Server

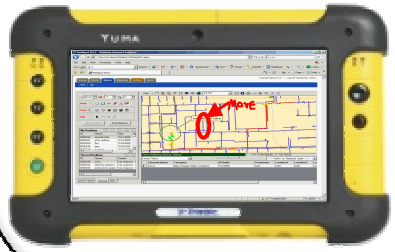
MOBILE FIELD CREWS & FLEETS

--Data Collection / Validation

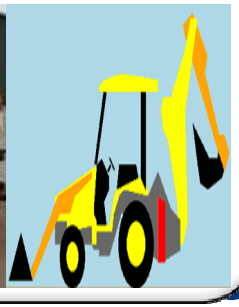
-Work & Incident Management

-Asset Management

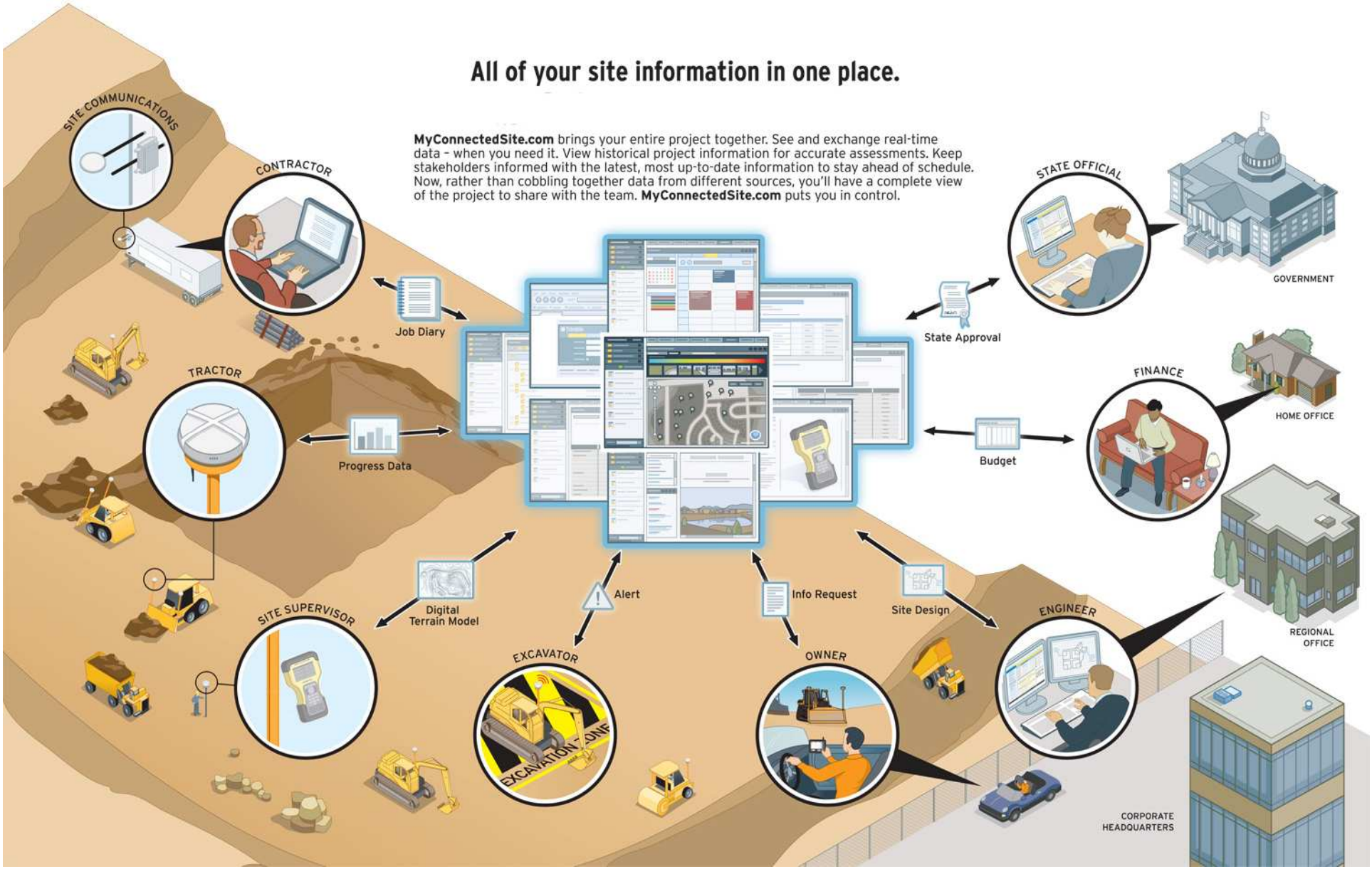
- Fleet tracking & Routing



CONTRACTORS – Intelligent Machines



Connectivity enables the intersection of professional, government, and consumer



Some Concluding Remarks

- 3D virtual worlds will be created with increasing spatial accuracy. The economic models and policy issues are yet to be resolved, but we can all play a part in that.
- The best things happen when technology, economic incentives and policy are aligned; easy to say, hard to do.
- Our profession is exciting , rapidly developing and multi-disciplinary; we all need to market it to the next generation.
- The ability to create solutions that utilize data from the public and private cloud will provide greater quality and accuracy of our solutions.