

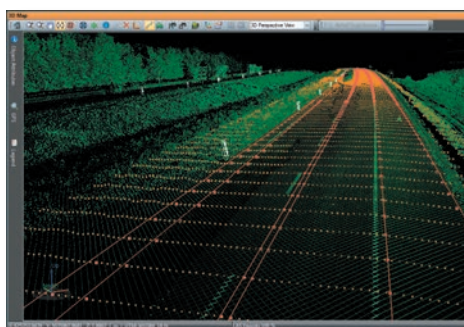


## Land Mobile Mapping & Survey

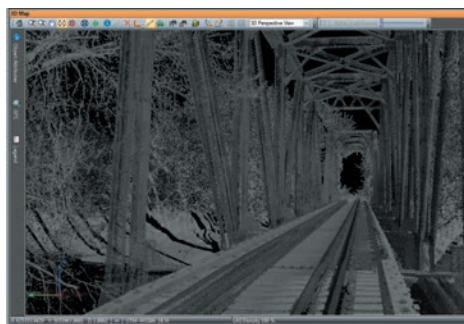
## TRIMBLE GEOSPATIAL SOLUTIONS

Trimble's geospatial solution portfolio has been designed to put information to work. Mobile sensors on the land, in the air or indoors capture geo-referenced images and point clouds that are exploited using production-scale feature extraction. The result: high-fidelity models that increase business productivity and improve decision-making.

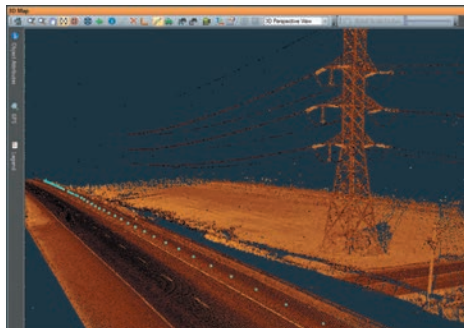
### LAND MOBILE MAPPING & SURVEY



*Roadway*



*Rail*



*Utility & Energy Corridors*

Mobile mapping and survey is opening new possibilities by enabling enormous amounts of highly accurate, geo-referenced spatial data to be rapidly collected and transformed into information-rich 3D infrastructure models.

Trimble's mobile mapping and survey solutions integrate our industry-leading geo-referencing technologies with very precise, high-speed laser scanning and high-resolution imaging sensors to deliver premium vehicle-mounted mobile spatial imaging systems. Terabytes of terrestrial imagery and point clouds for entire cities, highway networks, rail systems and utility corridors can be collected while operating at highway or railway speeds, often in a single pass.

However, raw data collection alone is neither practical nor complete. Trimble's mobile mapping and survey solutions are bundled with Trident Analyst software to control raw spatial data collection and automate key processes such as creating or extracting surface models, roadway signs, utility poles, roadside edges, pavement markings, horizontal and vertical clearances and road geometry.

This combination of premium sensors and productivity software facilitates projects that would be too slow and cost-prohibitive to complete using traditional mapping and survey approaches. The resulting high-fidelity models help infrastructure managers plan, design, build and maintain modern infrastructure, while maximizing safety and effectiveness.

## COLLECT

Use Trimble's Mobile Data Capture systems to quickly obtain geospatial data:

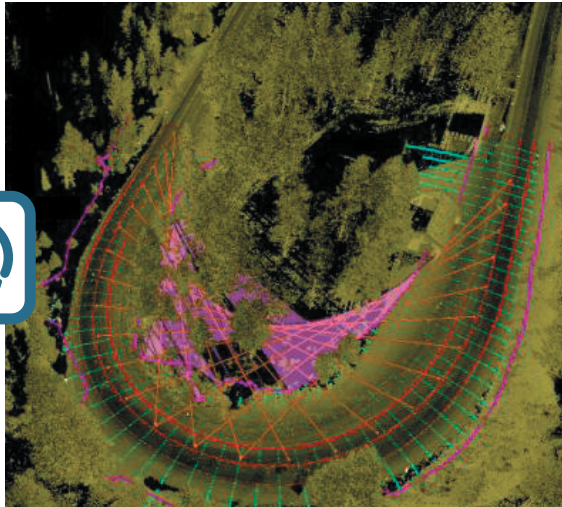
- Dense point clouds
- Highly accurate vehicle positioning and orientation
- High-resolution digital imagery



## EXTRACT

Rapidly convert raw data into geospatial intelligence with Trident Analyst software:

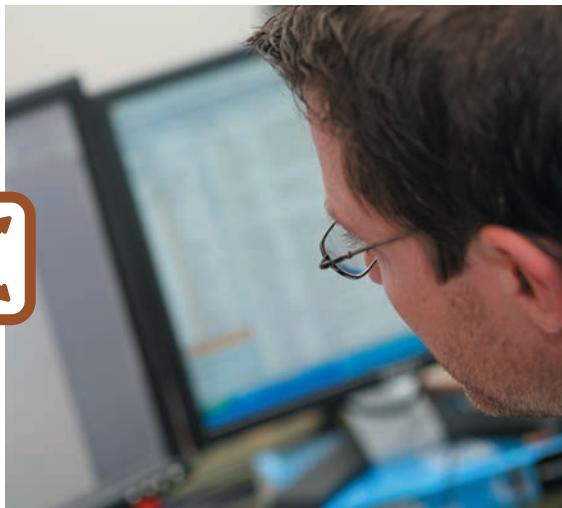
- Automated 3D feature extraction
- Manual 3D feature extraction
- Field-to-finish attributing codes
- Accuracy management



## DELIVER

Produce high-quality deliverables for your customers and stakeholders:

- CAD
- GIS
- Photolog
- Asset management systems



## MOBILE DATA CAPTURE SYSTEMS

### TRIMBLE MX8

The Trimble MX8 is a premium mobile spatial imaging system for capturing high-quality 3D spatial data quickly, accurately and effectively. The vehicle-mounted system is specifically designed for surveyors, engineers, and geospatial professionals conducting as-built modeling, inventory, inspection, encroachment analysis, and asset management for roadways, bridges, railway, utilities and other infrastructure management.

The Trimble MX8 is equipped with a pair of high-performance, 360-degree mobile laser scanners which capture incredibly detailed 3D infrastructure geometry in one pass. It uses high-frequency digital cameras that are embedded in a rigid enclosure at set positions and orientations to enable high-resolution image capture. The Trimble MX8 seamlessly integrates a POS LV positioning and orientation system, utilizing integrated inertial technology to generate stable, reliable and repeatable positioning and orientation solutions.



- High-speed, long-range, high-precision dual laser scanning
- Rigid sensor orientations for increased accuracy
- High-resolution panorama and surface imagery, creating a robust spatial foundation for information extraction
- Wide navigation and sensor base for easy installation on a variety of vehicle types
- Steep sensor pitch for minimal point cloud shadowing on overhead structures
- Fully compatible with Trident Analyst software



### TRIMBLE MX3

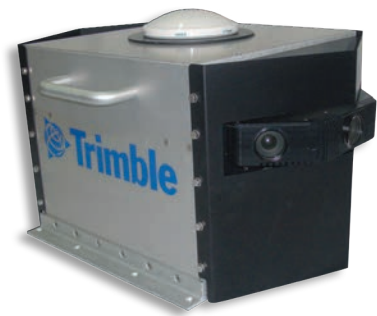
The Trimble MX3 is a highly practical and economical option for capturing rich 3D spatial data to meet a broad range of mapping and GIS corridor information demands. Combining cost-effective laser scanning technology with user-selectable digital imaging options, the Trimble MX3 provides the ability to produce a robust spatial environment to satisfy typical mapping and GIS needs from a mobile platform.

- Precision entry-level mobile laser scanning
- Multiple scanning configurations to optimize specific workflows
- Integrated high-resolution panorama and surface imagery, creating a robust spatial foundation for information extraction
- Fully compatible with Trident Analyst software for productive workflows in GIS and mapping applications

### TRIMBLE MX1

Delivering exceptional value for land photogrammetric applications, the Trimble MX1 provides a complimentary solution to traditional inventory feature collection methods.

- Fully geo-referenced and highly accurate for mapping and GIS applications
- High-resolution digital imaging for corridor feature extraction
- Calibrated camera lenses to eliminate lens curvature imperfections
- Image capture at user-definable time or distance intervals
- Scalable and upgradable
- Compatible with Trident Analyst software

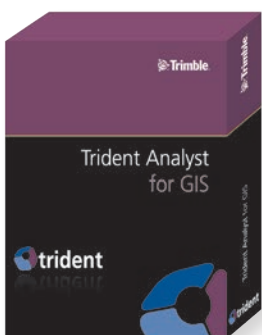
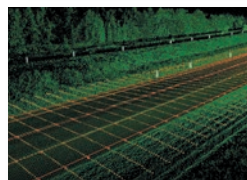


	Trimble MX1	Trimble MX3	Trimble MX8
<b>LASER SCANNING</b>			
Automated Feature Extraction		Yes	Yes
Accuracy		35 mm	10 mm
Precision	N/A	10 mm	5 mm
Frequency		Fixed: 13.5 kHz (x4)	Variable: 50 kHz – 300 kHz (x2)
Range		30 m $\sigma \geq 10\%$	@50 kHz: 180 m $\sigma \geq 10\%$ ; 500 m $\sigma \geq 80\%$ @300 kHz: 75 m $\sigma \geq 10\%$ ; 200 m $\sigma \geq 80\%$
<b>IMAGING MODULES</b>			
15 MP Forward Panorama	Yes	Yes	Yes
15 MP Rear Panorama	Optional	Optional	Optional
5 MP Oblique Surface	N/A	Optional	Yes
12 MP G360	Optional	Optional	N/A
<b>POSITIONING AND ORIENTATION</b>			
	AgGPS 262 receiver Upgrades Available	POS LV 220 Upgrades Available	POS LV 420 Upgrades Available

## TRIDENT ANALYST SOFTWARE

Mobile imaging and laser scanning systems create immense datasets that can quickly overwhelm manual workflows, therefore Trimble mobile data capture systems come with Trident Analyst software to manage field data capture, interpret images and point clouds and automatically extract features. These capabilities allow you to quickly transform your land mobile data into geospatial intelligence.

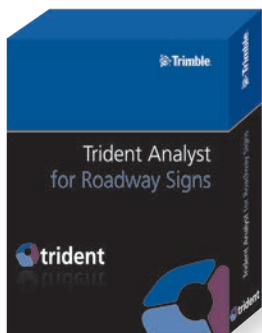
The Trident Analyst interface is designed for robust object positioning, measurement, and data layer creation—ideal for the analysis of geo-referenced imagery and laser scanner data. Industry-leading functions accelerate projects and increase productivity, including key automated processes such as surface modeling, roadway sign and pole detection, lane marking detection, edge and breakline detection, road geometry, and clearance measurements.



### TRIDENT ANALYST FOR GIS

Rapidly populate and maintain GIS databases.

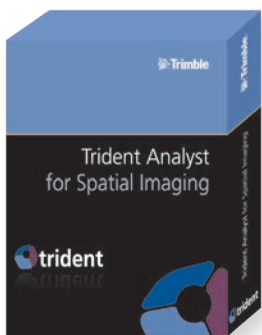
- Manual information extraction from digital imagery and point clouds
- User defined GIS data entry forms
- Projection of existing GIS database content on images and point clouds for easy data management
- Direct GIS database connection for multi-user data extraction and maintenance



### TRIDENT ANALYST FOR ROADWAY SIGNS

Create and maintain a network-level roadway sign inventory.

- Includes functionality from Trident Analyst for GIS software
- Automated extraction capabilities, including pole detection with change detection, sign detection with change detection, sign recognition, and pavement marking detection
- Enhanced quality control tools and sign databases



### TRIDENT ANALYST FOR SPATIAL IMAGING

Manage high-resolution digital imaging, dense point clouds and information extraction.

- Includes functionality from Trident Analyst for Roadway Signs software
- Enhanced automated extraction capabilities, including digital terrain models, roadway cross sections, roadway edges, roadway centerlines, vertical and horizontal clearances, and line-of-sight
- LAS and Land XML exports
- Supports advanced capabilities of the Trimble MX8 mobile spatial imaging system

## TRIDENT ANALYST FEATURE COMPARISON

	Trident Analyst Viewer	Trident Analyst for GIS	Trident Analyst for Roadway Signs	Trident Analyst for Spatial Imaging
<b>DATA IMPORT AND EXPORT</b>				
ODBC Database Connectivity	✓	✓	✓	✓
ESRI SHP	Input Only	✓	✓	✓
Point Cloud – Trimble Custom ASCII Format	View Only	View Only	View Only	✓
Point Cloud – LAS 2.0	View Only	View Only	View Only	✓
Point Cloud – LAS 1.1 & 1.2 Export				✓
Land XML Export				✓
<b>DISPLAY AND PLAYBACK</b>				
3D Map	✓	✓	✓	✓
Digital Imaging Playback	✓	✓	✓	✓
Point Cloud Viewing	✓	✓	✓	✓
Blended Digital Imaging and Point Cloud	✓	✓	✓	✓
<b>IMAGE / VIDEO MANIPULATION</b>				
AVI to JPG Conversion (with Titling)		✓	✓	✓
AVI to AVI Segmentation		✓	✓	✓
Image Mosaic Generation		✓	✓	✓
<b>ACCURACY MANAGEMENT</b>				
Camera Boresight Calibration		✓	✓	✓
Laser Boresight Calibration			✓	✓
Control / Target Detection				✓
Point Cloud to Control / Target Registration				✓
Point Cloud to Point Cloud Registration				✓
<b>LINEAR REFERENCING</b>				
Spatial to Linear Referencing Tool		✓	✓	✓
<b>MANUAL FEATURE EXTRACTION</b>				
3D Measurements from Point Clouds	✓	✓	✓	✓
3D Measurements from Images		✓	✓	✓
Photogrammetric Feature Add / Delete		✓	✓	✓
Point Cloud Feature Add / Delete		✓	✓	✓
<b>AUTOMATED EXTRACTION</b>				
Pole Detection (with Change Detection)			✓	✓
Sign Detection (with Change Detection)			✓	✓
Sign Recognition			✓	✓
Sign Compiler			✓	✓
Sign Library			✓	✓
Pavement Marking Detection			✓	✓
Edge Detection				✓
Centerline Detection				✓
Road Modeler (DTM, Cross Sections, Profiles)				✓
Horizontal / Vertical Line-of-Sight				✓
Horizontal / Vertical Clearances				✓

Your partner for the long road



Talk to Trimble about complete mobile mapping and survey workflows to transform land mobile data into land mobile intelligence

[www.trimble.com/geospatial](http://www.trimble.com/geospatial)

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