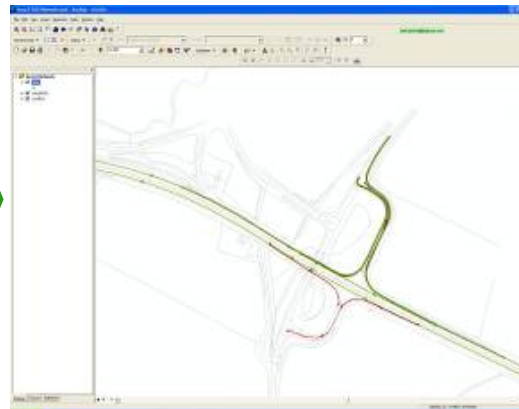
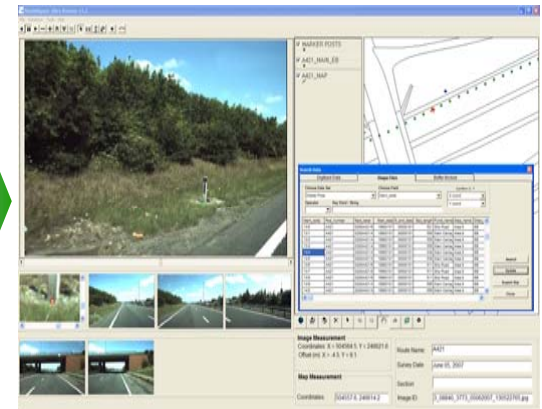




**Data acquisition**  
(video, imagery & position)



**Data Processing**  
validation & quality control



**Video Browser**  
(Desktop & Web)  
integrated video,  
mapping & database

### ➤ **Asset Management**

- ▶▶ Asset inventory collection
- ▶▶ Verification and validation of existing assets
- ▶▶ Continuous review and update asset condition
- ▶▶ Measurement of asset dimensions
- ▶▶ Export to external asset management systems and GIS applications

### ➤ **Planning and Studies**

- ▶▶ Scheme design & traffic signals
- ▶▶ Sign replacement programs
- ▶▶ HGV management strategies
- ▶▶ Speed limit reviews
- ▶▶ Street clutter studies
- ▶▶ Streetscape improvements
- ▶▶ Aid to public consultation and decision making
- ▶▶ Route familiarisation (diversion routes, gritting etc)

## Highway Applications (cont)

- **Engineering Design and Assessment**
  - ▶▶ Visual inspection of network and road geometry (reducing site visits)
  - ▶▶ Measurement of lane/footpath widths, height clearances and set-backs
  - ▶▶ Graphical aid to works specifications (imagery, GIS, CAD)
  - ▶▶ Review existing highway dataset - Deflectograph (life/overlay), TRACS/Scanner (cracking, texture, rut depth, ride quality), SCRIM (deficiency, coefficient), FWD (layer moduli), surface condition (defect maps)
  
- **Network Operation**
  - ▶▶ Traffic management/works planning
  - ▶▶ Record of physical and traffic environments
  - ▶▶ Planning of responses to events and diversions
  - ▶▶ Decision support tool for emergency lane closures and access
  - ▶▶ Facilitates communications with field staff/public
  - ▶▶ Aid for enforcement activities and assessment of claims

## RouteMapper Data Acquisition

<p><b>Superior image quality</b></p>	<ul style="list-style-type: none"> <li>➤ High resolution digital cameras</li> <li>➤ Flexible internal mounting</li> <li>➤ Multiple images per second - motorway/trunk roads ~ 1 frame per 5m at 80kph; urban roads ~ 1 frame per 2m at 40kph</li> <li>➤ High shutter speed for greater image quality and reduced blur</li> <li>➤ System copes with variable lighting conditions</li> </ul>
<p><b>Positioning &amp; measurement accuracy</b></p>	<ul style="list-style-type: none"> <li>➤ Primary Navigation: Omnistar corrected differential GPS</li> <li>➤ Secondary Navigation - optical sensor for linear interpolation and IMU when GPS is lost</li> <li>➤ Highly accurate positioning and in-frame measurements (in 2 and 3 dimensions)</li> <li>➤ Stereoscopic imagery for vertical measurements</li> </ul>
<p><b>Processing/Quality control</b></p>	<ul style="list-style-type: none"> <li>➤ Sophisticated diagnostics to trap positioning errors</li> <li>➤ Removal of stopped records (e.g. red lights, traffic jams)</li> <li>➤ Ability to insert new scheme data into existing datasets</li> </ul>

## The RouteMapper Suite of Browsers

<p><b>RouteMapper Desktop Browser</b></p>	<p><b>The complete solution</b></p> <ul style="list-style-type: none"> <li>➤ Integrated video, mapping and location referencing</li> <li>➤ In-frame measurement, feature extraction</li> <li>➤ Flexible database structure, compliant with multiple asset management systems</li> <li>➤ Designed for a multitude of operational and engineering applications</li> <li>➤ Import and editing of existing datasets</li> </ul>
<p><b>RouteMapper Interactive Web Browser</b></p>	<p><b>Web-based service to share video</b></p> <ul style="list-style-type: none"> <li>➤ Integrated video, mapping and location referencing</li> <li>➤ Accessible through standard web browsers</li> <li>➤ Hosted by IBI Group on a secure web farm</li> </ul>

## Desktop Browser - Key Features

<p><b>Fully integrated video, mapping &amp; database</b></p>	<ul style="list-style-type: none"> <li>➤ Access to imagery via map, database, location reference</li> <li>➤ Rapid switching between camera views</li> <li>➤ Advanced video controls (+/-, backwards/forwards, faster/slower)</li> <li>➤ Full zoom controls (image and map)</li> </ul>
<p><b>Digitisation &amp; Measurement</b></p>	<ul style="list-style-type: none"> <li>➤ Measurements in 2 and 3 dimensions</li> <li>➤ Digitise &amp; feature extract points and lines from video</li> <li>➤ Compatible with standard asset management systems</li> <li>➤ Creation of underlying GIS files while digitising</li> <li>➤ Full search, view and edit features</li> </ul>
<p><b>External Data Integration</b></p>	<ul style="list-style-type: none"> <li>➤ Overlay and interrogate existing GIS vector and raster data</li> <li>➤ Display, query and editing of 3<sup>rd</sup> party data (e.g. for verification of assets/condition)</li> <li>➤ Integration of engineering data (TRACS, Scanner, SCRIM, FWD etc)</li> </ul>

## The RouteMapper Desktop Browser

The screenshot shows the RouteMapper Ultra Browser v3.2 interface. At the top left, a toolbar contains video controls (play, stop, previous, next, full screen, refresh) and measurement & digitisation tools (ruler, digitiser, zoom, pan). The main window is split into three panes: a large video view on the left showing a road scene, a map view on the right showing a road network with a red dot indicating the vehicle position, and a 'Search Data' dialog box in the bottom right. The 'Search Data' dialog has tabs for 'Digitized Data', 'Shape Files', and 'Buffer Module'. It includes a table with columns: 'Ident\_code', 'Roa\_number', 'Sect\_label', 'Start\_date', 'S\_end\_date', 'Sect\_length', 'Fund\_name', 'Area\_name', and 'Dirac'. The table contains several rows of data, with the row for '13/4' selected. Below the table are 'Search', 'Update', 'Export Shp', and 'Close' buttons. At the bottom of the interface, there are sections for 'Image Measurement' and 'Map Measurement'. The 'Image Measurement' section shows coordinates: X = 504564.5, Y = 246621.6 and an offset: X = -4.5, Y = 9.1. The 'Map Measurement' section shows coordinates: 504557.6, 246614.2. To the right of these sections are input fields for 'Route Name' (A421), 'Survey Date' (June 05, 2007), 'Section', and 'Image ID' (3\_08840\_3773\_05062007\_130522765.jpg).

Video controls

Measurement & digitisation controls

Image clarity at high zoom level

Multiple image views

Mapping linked to video & database

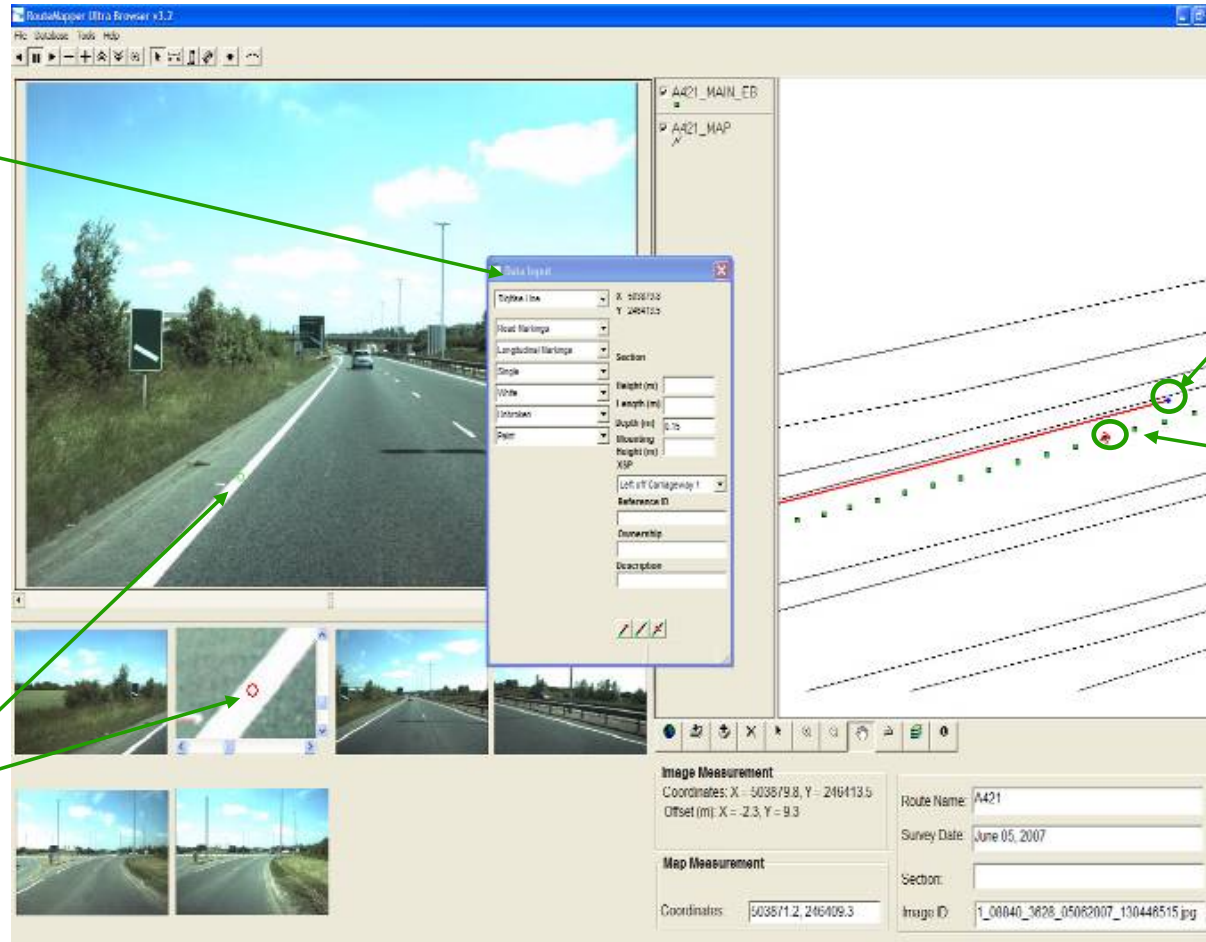
Vehicle position

Asset Database

## Digitisation and Measurement

User configurable digitisation form (points & lines); export to ERSI Shapefile and CSV format

Automatic image zoom to assist with measurement/digitisation



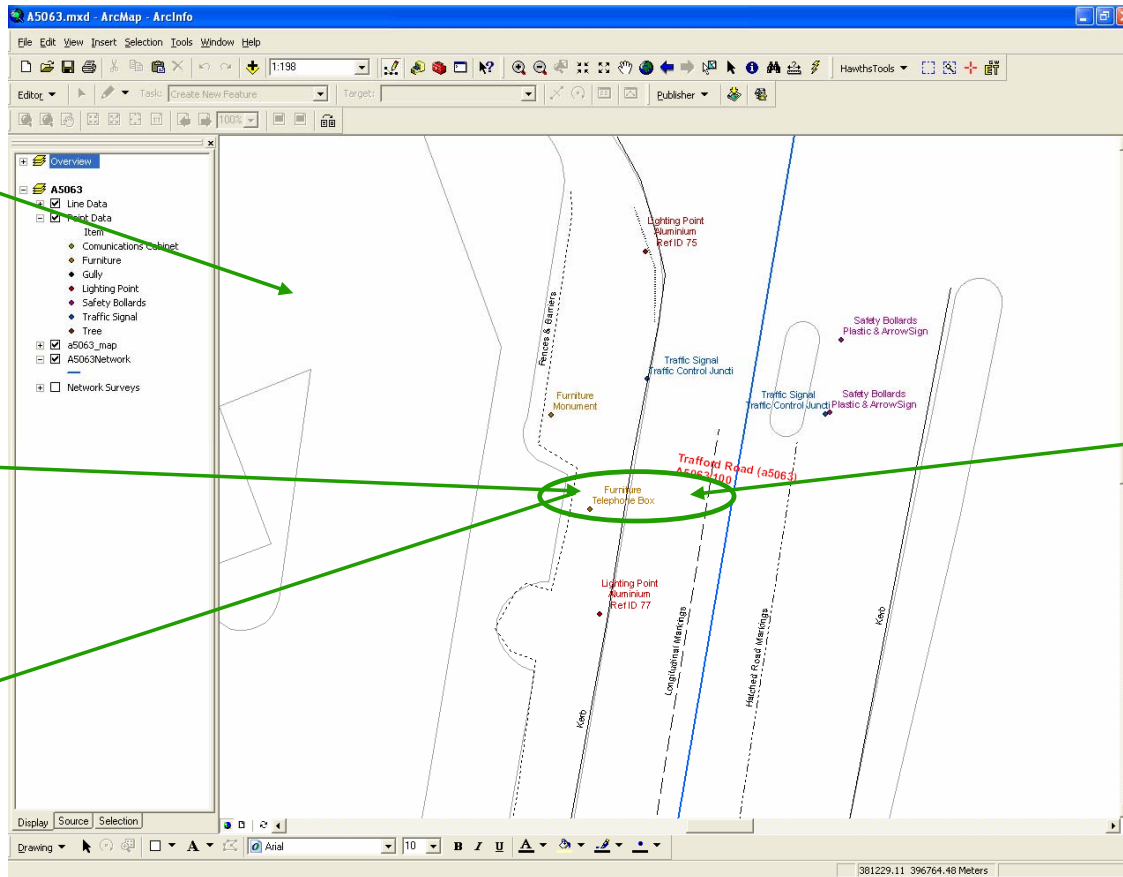
Position of line digitising on map

Position of vehicle

## Asset Inventory GIS Export

Extracted point and line data can be exported to standard GIS software

Point and Line data can be hyperlinked to the original RouteMapper images



SUBTYPE	ASSET	SUBTYPEID	FID	SHAPE
Traffic Signal	Road Traffic Sign	Post	8 Post	
Traffic Signal	Road Traffic Sign	Post	1 Post	
Traffic Signal	Road Traffic Sign	Post	2 Post	
Traffic Signal	Road Traffic Sign	Post	3 Post	
Traffic Signal	Road Traffic Sign	Post	4 Post	
Traffic Signal	Road Traffic Sign	Post	5 Post	
Traffic Signal	Road Traffic Sign	Post	6 Post	
Traffic Signal	Road Traffic Sign	Post	7 Post	
Traffic Signal	Road Traffic Sign	Post	8 Post	
Traffic Signal	Road Traffic Sign	Post	9 Post	
Safety Bollards	Road Traffic Sign	Internal	10 Post	
Safety Bollards	Road Traffic Sign	Internal	11 Post	
Safety Bollards	Road Traffic Sign	Internal	12 Post	
Safety Bollards	Road Traffic Sign	Internal	13 Post	
Safety Bollards	Road Traffic Sign	Internal	14 Post	
Safety Bollards	Road Traffic Sign	Internal	15 Post	
Safety Bollards	Road Traffic Sign	Internal	16 Post	
Safety Bollards	Road Traffic Sign	Internal	17 Post	
Furniture	Communications Cabinet	ID	18 Post	
Furniture	General Features		19 Post	
Furniture	General Features		20 Post	
Furniture	General Features		21 Post	
Furniture	General Features		22 Post	
Furniture	General Features		23 Post	
Furniture	General Features		24 Post	
Furniture	General Features		25 Post	
Furniture	General Features		26 Post	
Furniture	General Features		27 Post	
Furniture	General Features		28 Post	
Furniture	General Features		29 Post	
Furniture	General Features		30 Post	

Asset types and attributes stored for use within external systems



## RouteMapper Interactive Web Browser

Web solution for large scale access to spatial video

No client side software required; centralised data storage

Multiple methods of route selection (chainage, points of interest, etc)

Report creation and full image zoom

Video controls

Multiple image views



Multilingual interface

Integrated mapping and location referencing

Annotations managed by users

- **On-site software and data installation**
- **Training in use of software and asset digitisation**
- **Remote telephone and email support**
- **Customisation of software where required**
- **Membership in RouteMapper User Group**
- **Broad based consultancy to help clients get the most out of the spatial video**