

Hawkeye High Speed Data Surveying

Overview

Road Science now has three high speed data surveying vehicles – an older generation Hawkeye 1000, and two of the new Hawkeye 1000s. Operated by highly skilled technicians, the vehicles survey from Northland to Southland, and everywhere in between.

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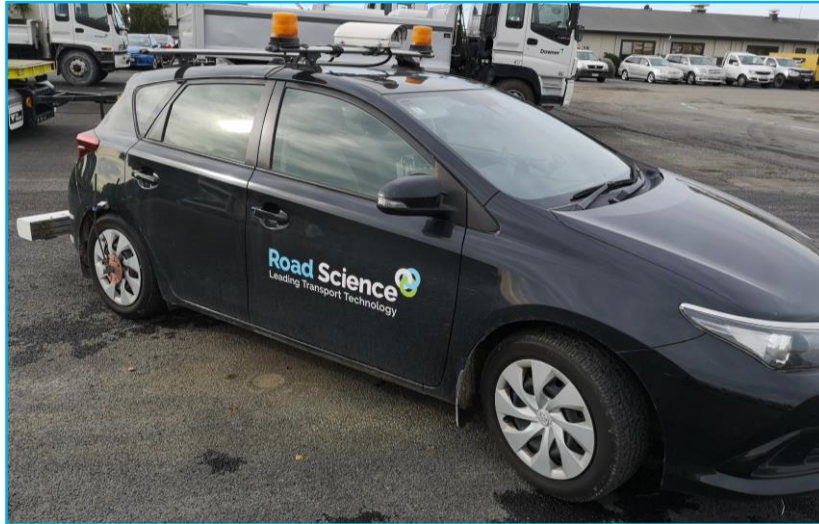
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Summary of Features

- All Hawkeye vehicles collect data from a Digital Laser Profiler (DLP). The data collected includes: International Roughness Index (IRI), Ride Number (RN), Mean Profile Depth (MPD), Sensor Measured Texture Depth (SMTD) and other parameters.
- The DLP system includes a vehicle-mounted measurement beam equipped with ARRB's newly developed lasers, enabling the collection of longitudinal profile, roughness and macrotexture (MPD and SMTD, later converted to SPTD if required).
- GPS, coupled with accurate distance measurement, enables the accurate tracking and tracing of vehicles, and easy location of interesting results/points of interest. Shape file outputs can be produced and used for future mapping applications.
- Used in conjunction with the Hawkeye Processing Toolkit, you have the ability to produce tables, graphs, reports and exports from your collected data.
- Both vehicles have asset view cameras to produce high resolution video capture of the road corridor, useful for desktop investigations.
- The new Hawkeye 1000s have geometric data collection capabilities, ideal for designers who need stress and geometry data to back up high-cost treatment decisions.

The Hawkeye 1000

- Digital Laser Profiler – texture and roughness measurement.
- Distance measuring instrument (DMI) coupled with GPS to provide results at accurate chainages.
- One mid-quality asset view camera, primarily used as a location device rather than an analysis tool.



The new generation Hawkeye 1000

- Digital Laser Profiler – texture and roughness measurement.
- Distance measuring instrument (DMI) coupled with GPS to provide results at accurate chainages.
- Two high quality asset view cameras, one front facing and one rear.
- GipsiTrac technology enabling geometric data collection in the form of horizontal and vertical curvature, grade, cross slope, camber and superelevation.



Digital Laser Profiler

- Comprehensive data collection in the form of roughness and texture.
- Applications include network level surveys with international standard results, accurate quality assessment for contractors, baseline surveys and contract validation.
- Outputs are available in raw data form for roughness, texture and geometry, all coupled with accurate distance measurements, or reports can be generated in a variety of different ways.
- Processing and reporting of results can be output at a variety of different lengths to suit the clients needs and specifications.
- Texture data can be collected in the form of SMTD then converted to SPTD through a known mathematical relationship, then used in the design process for chipseal resealing.
- All data is obtained while operating the vehicle at normal traffic speeds, saving time and money, and is possible on all sealed surfaces.



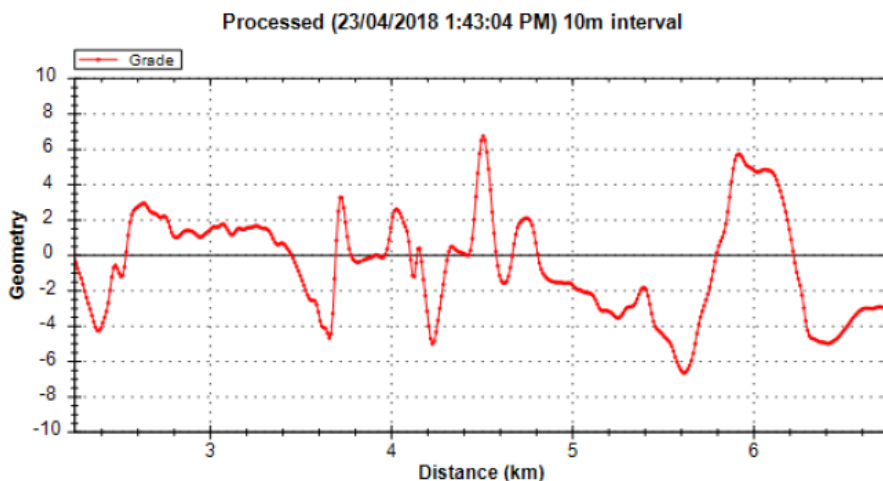
Asset View Digital Imaging System

- The latest digital camera technology to produce crisp, high resolution video frames which ensures a continuous digital record of the roadway. The calibrated video cameras accurately log digital images of roadside assets against other parameters such as distance and GPS.
- Fully motorised lenses enable the real-time adjustment of the optical zoom control, focus and iris for high-quality images.
- The Hawkeye Processing Toolkit and Data Viewer software ensures that the survey database can be reviewed, edited and processed quickly and efficiently.
- The data from each module can then be compared against other results and exported to pavement and asset management systems.
- A front and rear facing camera on the new HE1000s means there will always be at least one camera giving a clear view of the road corridor, free from sun glare.
- Outputs are available as digital imagery coupled with GPS and distance measurements (only when used with the HE Data Viewer or Processing Toolkit).
- Imagery is useful for desktop investigations of potential sites, there is no need to physically visit every site, saving time and money.

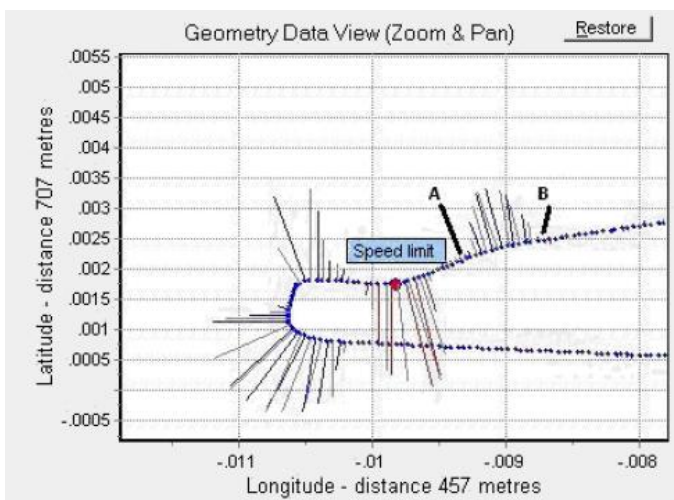


GipsiTrac Geometry System

- Vehicle mounted system that allows for the accurate and continuous collection of road geometry. The system records and combines data from digital gyroscopes, accelerometers and a distance GPS sensor accurate to sub-metre scales.
- A variety of outputs such as horizontal and vertical curvature, grade, cross slope, camber and superelevation (see below).
- From this geometric data, stress calculations can be made and stress factors applied to back up high-cost but appropriate treatment selections.
- Built in dead-reckoning sensors means GPS positioning can be acquired through tunnels or other areas where there is no reliable GPS coverage.
- Applications include general road geometry collection, either for designing or asset management purposes, location of potential ponding sites, assessment and validation of design specifications and determination of road stresses.



Here the grade (%) of a site is displayed against distance. Processing was at 10m intervals but can be customised to any interval that suits the client. This type of data representation can be used for cross slope, horizontal, vertical curvature etc.



Here the cross slope of a site is displayed, overlaid on top of the GPS route, with events marked where appropriate (i.e. speed limit). The cross slope before point A is negative (left side lower than right side) and between points A and B the cross slope is positive (left side higher than right side).

This type data representation can be used for other geometry parameters such as grade and curvatures.

Hawkeye Processing Toolkit and Data Viewer

Processing Toolkit

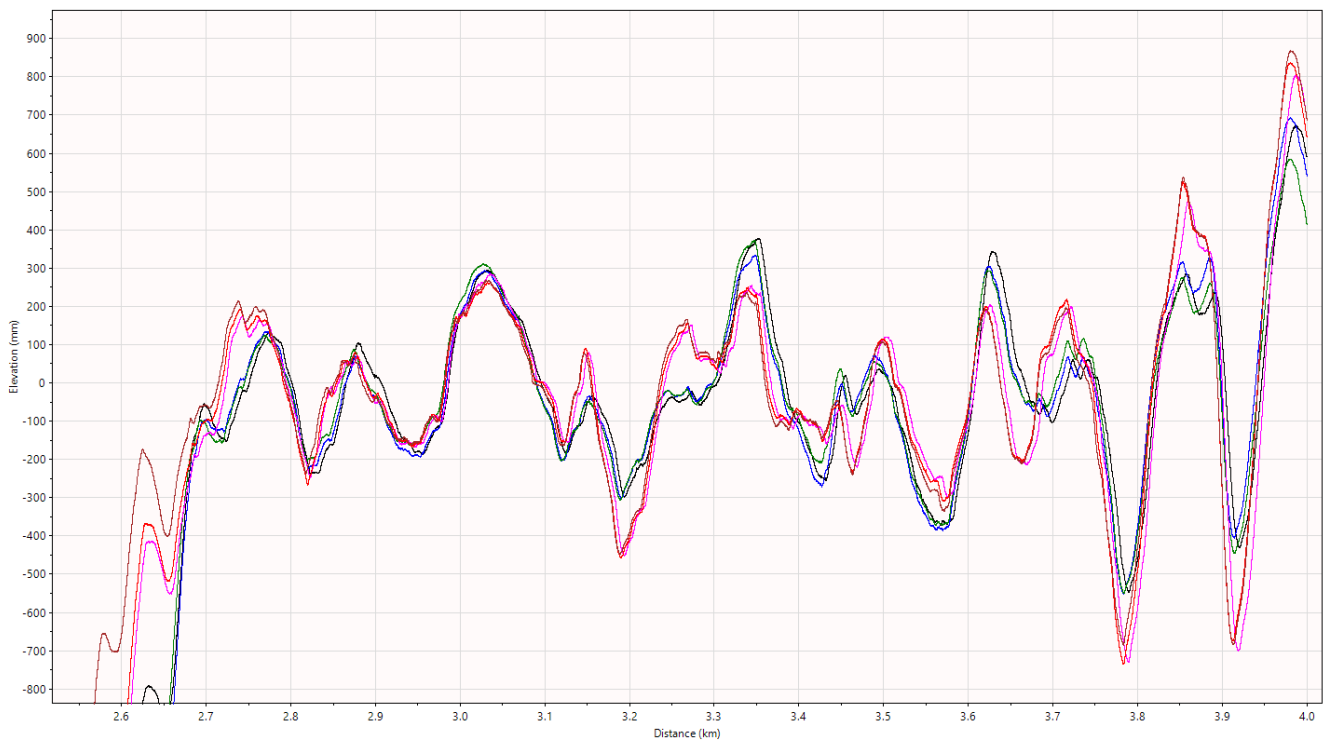
- The Hawkeye Processing Toolkit is a professional data processing, analysis and reporting tool to enable accurate processing of all collected parameters.
- The easy-to-use interface features an integrated image viewer and centralised database to review all collected survey parameters. The software can be used to review and rate individual video frames against chainage and GPS, save images to file and zoom-in to inspect areas of interest.
- Multiple images can be assessed simultaneously and the road can be 'driven' at a rate selected by the operator.
- Features such as data transfer tools, survey editing tools, data viewing/editing and advanced profiling are among just a few of the ever growing options available for the Hawkeye Processing Toolkit.
- Applications include analysis of survey data and profilometry, inventory assessment, virtual drive through of sites and various GIS applications.

Data Viewer

- The Hawkeye Data Viewer is an office-based program that enables enhanced assessment of sites to be completed by providing zoom and measurement tools for reviewing processed surveys.
- You can navigate your way through the Viewer by numerous methods including synchronised chainage, GPS path, and reference point or frame number. By having this visual record, the need for on-site visual inspections is reduced.
- The benefits of high resolution digital imaging for asset management systems include reviewing road pavements, kerbs, footpaths, signs, roadside vegetation, traffic management devices, parks and gardens and many other roadside assets.
- Analysis and playback of processed surveys can be undertaken, as well as the viewing of graphs and reports.

Further Data Analysis

- Road Science can perform further analysis from road profile or design level data if required, this includes level roughness analysis, power spectral density analysis (PSD), elevation profiles (example below) and simulated rolling straight edge analysis.
- Using the ProVal programme, design level roughness can be calculated, allowing clients to check whether roughness specifications are achievable.
- PSD analysis can be used to determine which wavelengths are most prominent in a road profile, this can inform where problem roughness areas are located.
- Simulated rolling straight edge testing takes a defineable length straight edge and simulates it moving down the road profile, recording sections that fall outside of a defined tolerance.



Contact Information

For more information or to book in a Hawkeye survey vehicle, please contact:

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