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## 18.0 FUTURE TRENDS AND TECHNOLOGIES

There has been an ever increasing demand placed on forensic science laboratories over the last few years. Proactive policing through technology has now placed laboratories under considerable pressure to increase throughput, decrease backlogs and to be cost competitive. The emergence of DNA analysis as an important investigative tool and one which the broader criminal justice system now relies upon has further added to the increase in demand and expectation. Another factor is the increased public awareness of the value of forensic sciences to criminal investigations particularly in relation to DNA.

Given the significant impact that DNA technology has had on forensic biology, NIFS commissioned Chris Pearman (Forensic Sciences, SA) & John Scheffer (Victorian Police Forensic Services Department) to conduct a benchmarking and information round of visits to the United Kingdom, Canada and the United States of America. A report, *Forensic Biology Automation & Future Developments – October 23 to November 15 2004*, outlining their findings was presented to NIFS for consideration by the forensic science community.

This report identifies experiences and future trends among some of the leading international forensic laboratories in relation to DNA testing. It also presents a proposed model for laboratories to consider.

The report highlights the following as critical future trends:

- Integrated information management systems;
- Automation of laboratory processes;
- Triage protocols; and
- Use of a unique identifier or barcode.

An Integrated Information Management System is essential to ensure consistency of data between the Crime Scene Examiners, the Laboratory Scientist undertaking analyses and the Investigating Officer. The report notes that Queensland has made significant progress in this area.

Automation of forensic sciences laboratory processes is regarded as an essential part of the future. The report confirms that properly planned and validated automated processes provide laboratories with three advantages:

- Higher throughput;
- Increased efficiencies; and
- Reduced error rates.

Both the FSS and the RCMP have fully automated the analysis of crime scenes samples. QHSS has a project team progressing automation.

The report also highlighted the need to have the following prerequisites in place prior to automation:

- Process re-engineering to identify:
  - What is to be achieved through automation;
  - How automated systems will be used to achieve these outcomes; and
  - Impact on staff;
- Agreed triage protocol to minimise unnecessary testing of items;
- Creation of a unique identifier (barcode) at the crime scene which is carried throughout the entire process; and
- An integrated information management system linking the crime scene investigators and laboratories.

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Queensland is well placed for automation as it has implemented the use of a unique identifier (barcode), has an integrated management system, and is analysing the processes used in the forensic biology and forensic chemistry laboratories. However, further work needs to be done within the criminal justice system to develop an appropriate triage process.

The NIFS report highlights a proposed model which would include the above points as well as the following:

- Sample tracking integrated with automation instruments to maximise throughput and Quality Assurance processes;
- Audit trails to monitor activities;
- Management of client bases;
- Management of staff development; and
- Information technology staff who knew the business of the laboratory.

The report further highlights some best practice from FSS which is at the forefront of forensic science service delivery. Key learnings from FSS are:

- Continuously requesting additional staff as a solution for growing demand is not sustainable;
- Alternative options for service delivery need to be developed to streamline operations while utilising current staff in the most efficient and effective manner;
- Move to an automated system is essential but lead time to set up robotics can take up to 2 years. Automation provides:
  - High success rates;
  - Decrease in contamination and sample handling errors;
  - Increase in contamination detection;
  - Increase in throughput;
  - Decrease in turnaround time;
  - Insignificant operator variation; and
  - Decreased staff numbers resulting in reduced costs.
- Timeliness, quality and effective costings are drivers; and
- Staffing numbers were reduced from 450 to 110 staff in the DNA database team working a seven day rolling week. The team performs 35,000 – 40,000 criminal justice samples per month using an automated system. In comparison, the London Laboratory performs 8,000 – 9,000 per month using a manual system.

The Taskforce notes that QHSS has made progress towards the implementation of some elements of best practice strategies as highlighted above.

***Recommendation 61:***

*It is recommended that the Chief Executive Officer of the Institute incorporates best practice strategies into the strategic planning processes for the next 3 – 5 years by 30 April 2006.*