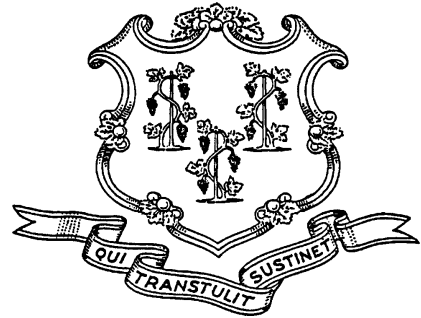# Department of Social Services

Report to the General Assembly
DSS Digital Imaging Project

An Overview of the DSS Digital Imaging Project Implementation and First Year Results

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March   1998

"From now on, falsified identifications will no longer be a ticket to receiving benefits under more than one name. We are going to make sure that no one can take advantage of the system in that way."
Governor John Rowland, 1/4/96

Executive Summary

On April 12, 1995, Governor John Rowland's Blue Ribbon Commission on Welfare Fraud released a report detailing their findings and recommendations after an extensive investigation of Connecticut's welfare system. They recommended that DSS implement a statewide identification system for welfare recipients. The report notes on page 32, the following:

"The commission has reviewed in great detail the technological, economic and practical considerations of digital imaging and concludes that the system presents unprecedented benefits with relatively few drawbacks. First, the systems demonstrated to the Commission are inkless. Second, the entire process is unintrusive and takes only seconds to complete at the time of registration for benefits. Third, the benefit card itself does not exhibit the fingerprint. Fourth, the accessing of benefits is unobtrusive and simple. Fifth, the system provides a virtually fail-safe, tamper-proof means of positive identification unavailable through other means, including photo identification cards with personal identification numbers (PINs) and magnetic stripe cards. The use of this evolving technology will improve the state's ability to detect provider fraud, an equally significant aspect of criminal activity in this realm."

During 1996 the Department of Social Services took historic action to uphold the integrity of the social services caseload by fighting hard against fraud and abuse. The Digital Imaging System has ensured that scarce public resources go to qualified individuals.

In addition to 3,541 TFA sanctions for non-participation in the digital imaging process during 1996 and 1,072 during 1997, the Department identified a number of individuals who had the misguided assumption that they could beat the system. Extensive statewide publicity has kept these numbers relatively low and has supported our concept that the major benefit of the system is its deterrent effect.

As you will see in this report, DSS has utilized cutting edge biometric technology to restore the public's confidence in the integrity of the welfare system. Digital Imaging has proven to be a cost effective fraud prevention tool in other states. Now Connecticut has joined Arizona, California, Illinois, Massachusetts, New Jersey, New York, Pennsylvania and Texas in adding this new tool to our arsenal of welfare reform strategies.

DSS conservatively estimates that in the first year of operation, savings of approximately $9,406,396 have been achieved. The leadership role assumed by DSS in implementing this fraud deterrent system underscores our commitment of service to our citizens and the integrity of our social services programs.

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Sec. 26. Section 17b-111 of the general statutes, as amended by section 22 of public act 95-194, is repealed and the following is substituted in lieu thereof:

On [or before April 1, 1997] AND AFTER JULY 1, 1998, the commissioner shall implement a [state] STATE-WIDE general assistance program AND ON OR BEFORE APRIL 1, 1997, THE COMMISSIONER SHALL IMPLEMENT SAID PROGRAM in the fourteen towns in which [a] THE regional [office] OR DISTRICT OFFICES of the department of social services [is] ARE located. The commissioner may contract for the implementation of such program. A TOWN, WITH A REGIONAL OR DISTRICT OFFICE OF THE DEPARTMENT AND A GENERAL ASSISTANCE OFFICE, MAY PETITION THE COMMISSIONER TO ALLOW SUCH TOWN TO CONTINUE THE OPERATION OF ITS GENERAL ASSISTANCE PROGRAM. THE COMMISSIONER, IN EXAMINING SUCH PETITION, SHALL CONSIDER THE COST EFFECTIVENESS OF SUCH TOWN'S GENERAL ASSISTANCE PROGRAM. A town shall be responsible for the certification of a medical bill for a recipient of the state general assistance program.

Sec. 27. Section 28 of public act 95-194 is repealed and the following is substituted in lieu thereof:

(a) For purposes of this section, "biometric identifier system" means a system which allows for the recognition of an individual through retinal scanning, finger imaging, hand geometry or facial recognition. The commissioner of social services and the commissioner of motor vehicles shall examine available biometric identifier systems and to the greatest extent possible, select a system which is compatible with the systems of surrounding states. The commissioner of social services may enter into a memorandum of understanding with the commissioner of motor vehicles, for the department of motor vehicles to provide the hardware, software, equipment maintenance, technical training, and other resources deemed necessary by the commissioner to establish said system.

(b) Said system shall be utilized FOR OFFICE USE ONLY in the following programs: (1) General assistance; (2) aid to families with dependent children; and (3) any other program to be determined at the discretion of the commissioner of social services.

(c) A recipient of a program utilizing said system pursuant to subsection (b) of this section shall participate in said system or be subject to disqualification from such program. The commissioner shall have the authority to exempt a recipient from participation in said system.

(d) The implementation of said system shall begin on or before January 1, 1996. The schedule of such implementation shall be determined by the commissioner of social services.

(e) Biometric identifier information obtained pursuant to subsection (d) of this section shall be the proprietary information of the department of social services and shall not be released or made available to any agency or organization and shall not be used for any purpose other than identification or fraud prevention in this or any other state, except that such information may be made available to the office of the chief state's attorney if necessary for the prosecution of fraud discovered pursuant to the biometric identifier system established in subsection (a) of this section or in accordance with section 17b-90 of the general statutes. The penalty for a violation of this subsection shall be up to a five thousand dollar fine or five years imprisonment or both and the cost of prosecution.

Sec. 4. Section 28 of public act 95-194, as amended by section 27 of public act 95-351, is repealed and the following is substituted in lieu thereof:

(a) For purposes of this section, 'biometric identifier system" means a system which allows for recognition of an individual through retinal scanning, finger imaging, hand geometry or facial recognition. The Commissioner of Social Services and the Commissioner

of Motor Vehicles shall examine available biometric identifier systems and to the greatest extent possible, select a system that is compatible with the systems of surroundings states. The Commissioner of Social Services may enter into a memorandum of understanding with the Commissioner of Motor Vehicles, for the Department of Motor Vehicles to provide the hardware, software, equipment maintenance, technical training and other resources deemed necessary by the commissioner to establish said system.

(b) AT THE CONCLUSION OR CANCELLATION OF THE CONTRACT ENTERED INTO PURSUANT TO THE MEMORANDUM OF UNDERSTANDING IN SUBSECTION (a) OF THIS SECTION, THE COMMISSIONER OF SOCIAL SERVICES MAY EXTEND THE CON-TRACT FOR NOT MORE THAN ONE YEAR, PROVIDED, NO LATER THAN ONE YEAR AFTER SUCH CONCLUSION OR CANCELLATION, THE COMMISSIONER SHALL IS-SUE A REQUEST FOR PROPOSALS FOR PROVIDING THE HARDWARE, SOFTWARE, EQUIPMENT MAINTENANCE, TECHNICAL TRAINING AND OTHER RESOURCES DEEMED NECESSARY BY THE COMMISSIONER TO MAINTAIN OR IMPROVE SAID SYSTEM. THE SUBSEQUENT CONTRACTOR PROVIDING THE RESOURCES FOR SAID SYSTEM SHALL BE AWARDED PURSUANT TO SECTION 4a-59 AND SHALL BEGIN NO LATER THAN ONE YEAR AFTER SUCH CONCLUSION OR CANCELLA-TION.

[(b)] (c) Said system shall be utilized for office use only in the following programs: (1) General assistance; (2) aid to families with dependent children; and (3) any other program to be determined at the discretion of the Commissioner of Social Services.

[(c)](d) A recipient of a program utilizing said system pursuant to subsection (b) of this shall participate in said system or be subject to disqualification from such program. The commissioner shall have the authority to exempt a recipient from participation in said system.
[(d)](e) The implementation of said system shall begin on or before January 1, 1996. The schedule of such implementation shall be determined by the Commissioner of Social Services.
[(e)](f) Biometric identifier information obtained pursuant to subsection (d) of this section shall be the proprietary information of the Department of Social Services and shall not be released or made available to any agency or organization and shall not be used for any purpose other than identification or fraud prevention in this or any other state, except that such information may be made available to the Office of the Chief State's Attorney if necessary for the prosecution of fraud discovered pursuant to the biometric identifier system established in subsection (a) of this section or in accordance with section 17b-90 of the general statutes. The penalty for a violation of this subsection shall be up to a five thousand dollar fine or five years imprisonment or both and the cost or prosecution.

(g) THE COMMISSIONER OF SOCIAL SERVICES SHALL REPORT TO THE JOINT STAND-ING COMMITTEE OF THE GENERAL ASSEMBLY HAVING COGNIZANCE OF MATTERS RELATING TO HUMAN SERVICES, IN ACCORDANCE WITH THE PROVISIONS OF SEC-TION 11-4A, ON OR BEFORE JANUARY 1, 1997, AND ANNUALLY THEREAFTER, THE FOLLOWING INFORMATION: (1) THE NUMBER OF RECIPIENTS PARTICIPATING IN SAID SYSTEM; (2) THE NUMBER OF RECIPIENTS WHOSE BENEFITS HAVE BEEN DISCON-TINUED DUE TO THEIR FAILURE TO PARTICIPATE IN SAID SYSTEM; (3) THE COST OF IMPLEMENTATION AND OPERATION OF SAID SYSTEM; (4) THE AMOUNT OF SAVINGS ATTRIBUTED TO THE ESTABLISHMENT AND OPERATION OF SAID SYSTEM; AND (5) THE COMPATIBILITY OF SAID SYSTEM WITH BIOMETRIC SYSTEMS BEING UTILIZED IN SURROUNDING STATES.

Approved May 31, 1996. Effective October 1,1996.

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There are many biometric technologies available commercially. Determining which would be best suited to Connecticut's needs was not at all difficult. The three fundamental objectives of the Connecticut system were:

1. At enrollment, ensure that the individual is not already receiving benefits (Requires 1:Many Identification)
2. Verify, on an as needed basis, that the recipient is who they say they are (Requires 1:1 Verification)
3. Complete the identification and verification processes with minimal inconvenience to our recipients.

On July 12, 1995, at the invitation of DSS, representatives from many of the major commercial biometric companies made presentations on each of the technologies, highlighting the benefits and articulating their vision of how their systems could work for DSS.

Biometric Technology	1:Many Suitability (Identification)	1:1 Suitability (Verification)	Typical Application
Digital Imaging (Fingerprints)	Yes	Yes	All requiring unique identity
Hand Geometry	No	Yes	Border Control
Eyescan/Retinal Scan	Possible	Yes	High Security access control
Facial Imaging	Possible	Yes	Surveillance, access control
Voice Recognition	No	Yes	Telephone banking, Internet commerce
Signature Verification	No	Yes	Benefits payments

While many biometric technologies are available, the most mature biometric, proven reliable in many large scale applications, is finger imaging. Finger imaging is at this point in time, the only biometric proven reliable in the 1:many identification field. It is also emerging as the biometric of choice for other states interested in civil AFIS applications.

The General Accounting Office (GAO) reported that "fingerprinting may be the most viable option" for EBT in its report "Electronic Benefits Transfer - Use of Biometrics To Deter Fraud In The Nationwide EBT Program." One of the objectives noted in the GAO's conclusion is the ability to do cross state matching with finger imaging. As noted in chart 3.1, finger imaging is the only biometric that assures this ability.

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Review of Existing Systems in Other States

In order to ensure compatibility with the systems in surrounding states, site visits were made to the following biometric imaging sites:

State	Location	Target Population	Enrollments 12/96
New York State	Albany	AFDC/GA	765,000
	Nassau County	GA	8,000
	Suffolk County	GA	10,000
New Jersey	Trenton	GA	20,000

In addition, extensive amounts of data were readily available on the Los Angeles County AFIRM system. This is without a doubt the best documented system in the world of civil AFIS systems. A complete evaluation of the system was performed by the well known firm of Ernst & Young LLP.

3.1   Chart Of Biometric Identification Systems By State:

As of March 1998, the following chart describes all currently known biometric identification systems in use in the United States in the various Departments Of Social Services.

States With Biometric Systems

State	County or Statewide	Biometric Type	Enrollment	Status
Arizona	Statewide	Finger Imaging	Rollout	Active
California	Alameda	Finger Imaging	17,000	Active
	Contra Costa	Finger Imaging	6,000	Active
	Los Angeles	Finger Imaging	550,000	Active
	Orange	Finger Imaging	5,000	Active
	Sacramento	Hand Geometry	20,000	Active
	San Diego	Finger Imaging	11,000	Active
	San Francisco	Finger Imaging	15,000	Active
Connecticut	Statewide	Finger Imaging	150,000	Active
Illinois	Pilot	Finger Imaging	17,477	Active
Massachusetts	Beta Test	Facial Imaging	79,000	Active
	Pilot	Finger Imaging	4,456	Active
New Jersey	Northern	Finger Imaging	46,000	Active
New York	Statewide	Finger Imaging	1,000,000	Active
Texas	Pilot	Finger Imaging	110,000	Active

States that have published RFP's:

- North Carolina   Statewide system, RFP issued 1/98
- California   Statewide system, "CAFIS", RFP stage, 6M enrollments in 4 years
- Florida   Statewide system, RFP issued 1/98
- Pennsylvania   "PARIS System", RFP stage

(Note: All of these are based upon finger imaging technology)

States attempting to introduce legislation:

- Delaware
- Maryland
- Michigan
- Mississippi
- West Virginia
- Vermont

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This following sections discuss the design approach Connecticut chose to implement a state-wide electronic personal identification system. It documents the system's configuration, and highlights several implementation challenges, including planning statewide rollout and achieving public acceptance.

The Connecticut DSS Digital Imaging System was designed to provide the following:

- Convenient and accurate enrollment of qualified General Assistance (GA) and Aid to Families with Dependent Children (AFDC) clients into a statewide database;

- Issuance of tamper-resistant identification cards that incorporate finger-image "identifiers" stored in two-dimensional barcodes;

- Utilization of finger-image identification to verify that enrolled clients are eligible to receive benefits.

Connecticut's objective was to create a system that would eliminate "dual enrollments". We believe that this is a major component of welfare fraud. Our objectives included biometric identification/verification based on finger-imaging technology; centralized image storage and retrieval; and over-the-counter identification card production.

Our implementation strategy was to work together with other agencies to create a standard hardware platform that would serve the needs of both the Department of Social Services (DSS) and the Department of Motor Vehicles for image capture and ID card production.

In July 1995 a legislative deadline to have the system up and running was set for January, 1996. Other states contacted had spent, on average, 1 ½ to 2 years in planning this type of system implementation. With the dedication of DSS staff, the assistance of other state agencies and the cooperation of the contractor, the Digital Imaging System became operational on January 22, 1996. Because of the deadline, DSS's system planning phase was reduced to less than six months.

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5.0   Enrollment Populations

DSS Commissioner Joyce Thomas determined that the state's adult AFDC (Aid To Families With Dependent Children) now referred to as TFA (Temporary Family Assistance) recipients along with adults in receipt of General Assistance benefits from the states 169 towns would be imaged first. At the time of the signing of the contract these client populations were approximately 60,000 and 24,000 respectively. These two groups were chosen first because of clear legislative intent to meld this project into the state's comprehensive welfare reform strategy. 148,784 persons have been enrolled in the system by close of business 2/28/98.

Prior to the implementation of digital imaging, DSS used an antiquated Polaroid client ID system to produce client identification cards. The former ID system was not automated in any way. Photos were taken by a stand alone manual camera. The system had no ability to forward any of the data or photos collected to a database.
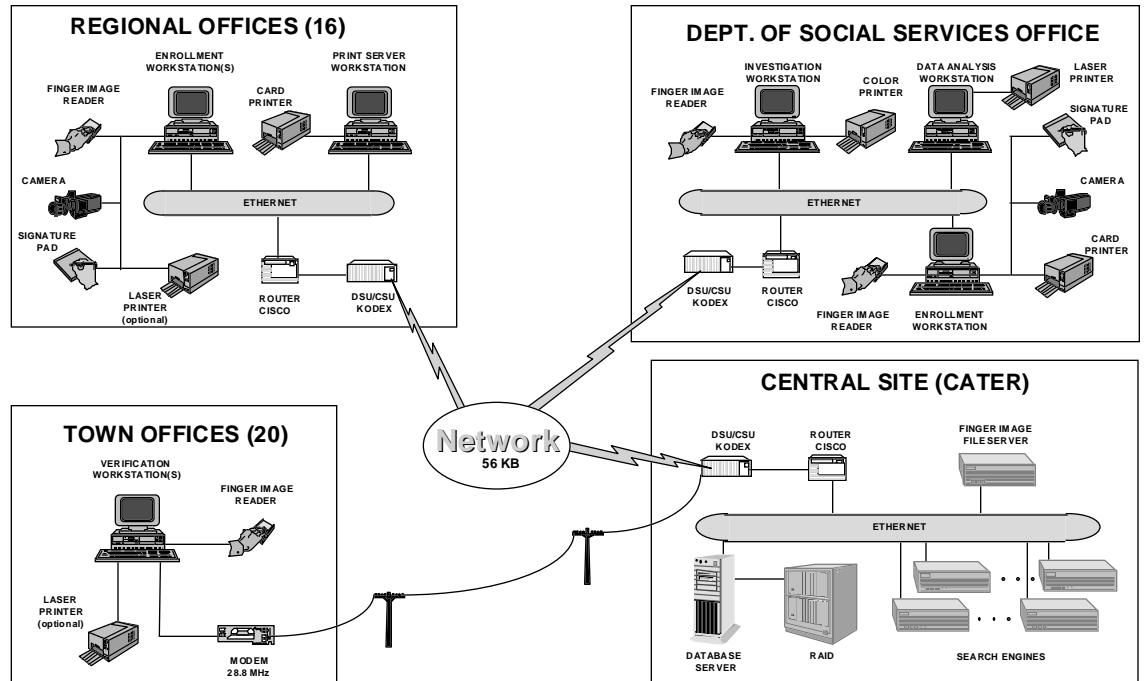
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6.0   Statewide Rollout Planning

Enrolling 84,000 recipients in less than six months required precision planning and execution. The state's five regional offices and the towns they covered were divided into 3 phases for enrollments. Sixteen DSS offices along with twenty major General Assistance sites have permanent workstations and had communications established to a central site within sixty days. Each began enrolling new applicants immediately. At the same time roving teams of contractor's staff used transportable equipment to enroll recipients in each of the 169 towns. An intensive effort to collect demographic information on each recipient from a variety of manual and automated town systems in advance was part of an overall strategy that would accomplish two things. First, it would speed up the enrollment process. Second, it would provide a point in time database that could be used for future evaluation and statistical study of the effects of implementing such a system. It would also allow the completion of later periodic recidivism[1] studies.

All DSS offices have one or more permanent enrollment workstations. The top 20 General Assistance offices have one or more verification-only workstations. With the implementation of State Administered General Assistance (SAGA) and the takeover of 11 GA towns verification units have been deployed to alternate sites.

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[1] Recidivism: A tendency to relapse into a previous condition. See section 17.0

Equipment Configuration

REGIONAL OFFICES (16)

FINGER IMAGE READER

ENROLLMENT WORKSTATION(S)

CARD PRINTER

PRINT SERVER WORKSTATION

CAMERA

ETHERNET

SIGNATURE PAD

LASER PRINTER (optional)

ROUTER CISCO

DSU/CSU KODEX

DEPT. OF SOCIAL SERVICES OFFICE

FINGER IMAGE READER

INVESTIGATION WORKSTATION

COLOR PRINTER

DATA ANALYSIS WORKSTATION

LASER PRINTER

SIGNATURE PAD

ETHERNET

CAMERA

CARD PRINTER

DSU/CSU KODEX

ROUTER CISCO

FINGER IMAGE READER

ENROLLMENT WORKSTATION

TOWN OFFICES (20)

VERIFICATION WORKSTATION(S)

FINGER IMAGE READER

LASER PRINTER (optional)

MODEM 28.8 MHz

Network
56 KB

CENTRAL SITE (CATER)

DSU/CSU KODEX

ROUTER CISCO

FINGER IMAGE FILE SERVER

ETHERNET

DATABASE SERVER

RAID

SEARCH ENGINES

The enrollment workstations are based on an Intel 75 MHz Pentium, with 32 MB RAM, 1080 MB hard drives. A Hitachi VK370W RGB Camera, Identix fingerprint capture device, Wacom signature tablet and Symbol "toaster" 2D Bar Code reader are used. Over the counter card production is provided via Atlantek Model 60 Thermal Dye Sublimation card printers.

Central site equipment includes a HP 735/125 as a fingerprint server. HP/735/125 as a Sybase Server and six pairs of HP712/60 search engines along with other equipment. DSS uses five different workstation configurations:

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- An **Enrollment** workstation
  A full function workstation configurable in any mode for any type of enrollment or verification and finished card production. Enrollment consists of scanning the applicants 2 index fingers, capturing a portrait photo and a signature along with basic demographic data.

- A **Verification** workstation
  Designed for verification only. By verification we mean that the system is capable of comparing the live scans of minutiae[1] with the finger minutiae record that is stored in the system or on the ID card. The system can do a 1:1 verification based upon the 2D barcode alone, selection of an already enrolled case or a complete search of the existing database.

- A **Special Investigative Unit** workstation
  This workstation is designed for the exclusive use of a specially trained technician who evaluates possible match candidates. Graphic comparison tools are available in this workstation to enhance the decision making process.

- A **Data Analysis** workstation
  The Data Analysis workstation is configurable as an enrollment, verification or special investigation workstation minus the camera, bar code reader, signature pad and finger scanner. It's primary design function is provide a vehicle for ongoing real time or historical ad-hoc reports. R&R Report Writer for SQL was selected to perform this function.

- A **Portable Laptop** enrollment only workstation
  An IBM Thinkpad model 365 was engineered for use in remote enrollment situations where applicants were unable to report to Regional Offices due to physical or other handicaps. DSS decided early on that they would not resort to manual fingerprinting in these cases. The contractor was asked to design a completely portable version that could be carried in one package. On completion of the days activity, the operator returns to the DSS Regional Office and uploads new enrollments via a built in Ethernet connection. The laptop performs all of the functions of an enrollment workstation with the exception of card issuance.

[1] In the classification of fingerprints, minutiae points are identifiable intersections of ridges, ridge endings, etc. These can be mathematically located and plotted. No two fingers contain identical minutiae points rendering each individual as unique, even twins.

Under current state law, town administered General Assistance recipients must pick up their monthly checks in person. If desired, General Assistance offices can verify the identity of each person appearing in person to collect benefits through the use of the photo/biometric identification card or system, where available. Both full enrollment and verification only workstations are configured with the ability to verify the cardholders identity in a 1:1 match via the minutiae encoded in the 2D Bar Code on the face of the card. This method was chosen due to its rapid speed and easy integration into DSS current processes.

- The card construction utilizes a thermal fusion process rather than an adhesive;

- There are two layers of plastic, a transparent receptor film and an opaque security substrate bonded together in a single sheet. Once bonded the layers cannot be separated;

- When the film and substrate are sealed, the printed images are sealed inside;

- A visible retro-reflective security image of Connecticut's coat of arms that changes in color and intensity as you tilt the card.

The card contains the client's digitized color portrait, digitized signature and a 2D Bar Code. The 2D Bar Code contains only the client's fingerprint minutiae. On the reverse side of the card is a low coercivity mag stripe which will contain the required data for future EBT benefit transactions.

The 2D Bar Code:
Connecticut chose the AAMVA standard PDF417 symbology for several reasons:

- The 2D code can carry a large amount of information;

- It is very inexpensive to produce on a card and can be generated in an over the counter card issuance situation;

- The codes have robust error correction capability to survive wear and abuse;

- The codes can contain any form of static data including text, photographs, fingerprints, signatures or any combination thereof.

PDF417 can be thought of as "paper memory" in that it can store text, numeric or binary data, just as a floppy disk can store any type of data. Additionally, these different forms of information may be intermixed within one PDF417 symbol.

The PDF417 datafile will last for the life of the physical card or document. It can be bent or distorted with no impact on readability. In addition, because reading a PDF417 based card requires no physical contact, there is no finite limitation on the number of times the card can be read.

The Connecticut 2D Bar Code contains approximately 1,200 characters of binary storage (two minutiae maps) with a 1,600 character total capacity leaving more than enough room for redundancy. There is no additional encryption involved as the minutiae map can only be read by NBSI/NRI software.

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10.0 SYSTEM COSTS

The Connecticut DSS Digital Imaging contract is valued at $ 5.1 million dollars for 3 years. The contract includes purchase of all equipment, maintenance and operations costs for 3 years, 2 project managers and a special investigations operator/technician. In addition, the contractor supplied data entry operators for the first nine months of operation. The contractor established an office in Connecticut to service our system and hired a 10 person staff through a combination of individual subcontracts with local individuals or as full time NBS employees. This enabled DSS to enroll our target population in a relatively short time period without impacting customer service at our regional offices.

Cost Identifier	3 Year Cost
All Hardware	$ 1,256,895.65
All Software	889,262.14
All Maintenance & Operations	1,878,239.16
Temporary Data Entry Operators	813,600.00
ID Card Production	303,046.39
All Costs	$ 5,141,043.34
Total Digital Imaging	$ 3,989,095.07
Total GA Database	$ 1,151,948.27

Cost Per Case Enrolled

Yearly cost for Digital Imaging alone	$1,329,698.36
3 year enrollment projection	200,000 individuals
Projected cost per case, per year	$6.64

(Total Contract) - (GA Database Cost) = (Digital Imaging alone)
(Digital Imaging alone) divided by (200,000 enrollees) divided by (3 year) = (Cost per case, per year)

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Anecdotally, opponents of the system at times characterized it as invasive and dehumanizing. DSS's plan to change that narrow perception was simple. The state's chief executive would be the first person in Connecticut to be digitally imaged.

At a major press conference on January 4, 1996, Governor John Rowland announced the new system, was imaged in full view of all state media and was issued an identification card. State Representative, Jeanne Garvey, affectionately known as "*The Mother of Digital Imaging*" was imaged second. DSS Commissioner Joyce Thomas and Deputy Commissioner Michael Starkowski also participated in the demonstration along with several other state officials. Members of the press were also invited to participate. The demonstration of the application of the technology was straight forward and displayed to the press and those attending that the process was harmless to the individual client and in no way intrusive.

Public perception of the biometric process and acceptance of the process raises three major questions.

- How does a biometric identification system stack up against traditional American standards of privacy, due process and individual liberty?
- Does the modern application of biometric technologies meet the standards of non-discrimination and equality required in all DSS programs?
- Does the American public view a particular biometric technique as acceptable in terms of physical process and the purpose for which it is being implemented?

DSS's research into the first two questions revealed a wide range of judicial decisions supporting the rights of organizations to require positive identification via the use of fingerprinting. The touchstone case cited in most legal journals identified DAVIS V. State of Mississippi (394 US 721,89 S.Ct.1394). DSS's administrative process allows for due process and the recipient's right to administrative hearings and an appeal process.

According to Dr. Alan F. Westin, Professor of Public Law and Government at Columbia University and the Opinion Research Corporation (ORC) of Princeton New Jersey, in a national survey conducted for a US biometric technology firm, there "…are very high levels of support in the public… for using finger imaging" in applying for government welfare, health care and other entitlement programs. ORC found a positive supportive response from 81% of the respondents surveyed on this issue.

Digital Imaging has been a hot topic in many newspaper editorial pages and other articles. Many have lent their support to the DSS plan including the following:

Hartford Courant, 5/1/93, editorial   *"Fingerprinting appears to have a deterrent effect… Is there really any difference between a photo of fingerprints and the common mug shot on photo Ids used for driver's licenses, security badges and a host of other reasons?"*

Hartford Courant, 12/2/95, editorial *"For honest people, there simply is no shame in being fingerprinted. Thousands of people are fingerprinted just because of where they*

work: computer programmers at Massachusetts Institute of Technology, assembly-line workers at Raytheon and law enforcement officers across the nation, just to name a few."

New Haven Register, 1/25/96, editorial   *"A report released by the New York Department of Social Services determined that a controversial program intended to prevent welfare abuse is working. … This program is worth a serious look"*

New Haven Register, 3/6/96, article,   *"I didn't mind it, because when there's welfare fraud, it hurts people who really need it," said a 57-year-old woman. "I think it's a good idea, because it will stop a lot of welfare fraud."*

Norwich Bulletin, 4/12/96, editorial *"An identification program should not be regarded as demeaning. It should be seen as a means of ensuring the system works properly and fairly. As such it would be but one small piece of the welfare-reform puzzle."*

Connecticut Post, 4/13/96, article   *"Double dipping may become impossible for welfare clients thanks to a new computer identification system being installed at the city's welfare office and other such offices statewide."*

Hartford Courant, 1997, article   *"More than four out of five people polled said they favor fingerprinting welfare recipients to cut down on fraud…"*

Biometric identification systems, once viewed as a science fiction staple only, are now being implemented in a variety of ways that are becoming more visible to the public:

- A major announcement was made by MasterCard that they are testing finger imaging for use as a PIN (Personal Identification Number) with their credit and debit cards.
- Implementation of the first Credit Union ATM's in Lafayette Indiana utilizing finger imaging instead of a PIN.
- Announcements by major network software developers about the introduction of finger imaging access to secure financial and other networks including the Internet.
- An announcement by the North East Coalition of States (NCS) that they will pilot EBT access at ATM's and point of service locations in New York State utilizing finger imaging instead of a PIN.
- The state of Texas announced in August 1997 that they will assess the feasibility of implementation of a finger imaging / EBT point-of-sale system. They expect to release an RFO late in 1997.
- A major computer keyboard manufacturer is selling standard PC keyboards with finger image scanners built in. They anticipate a huge growth in the demand for this technology.
- A hospital in Florida using finger imaging to insure confidentiality and restrict access to patient records in their computer system.
- The use of biometrics to control access to the Olympic Village at Atlanta, GA during the summer of 1996.
- The use of biometrics at Disney World for long term passholders.

All of the above combined highlight a growing public acceptance and use of biometric technology.

Another strategy used by DSS to change public perception was to issue a Digital Imaging Fact Sheet along with the usual press releases. The fact sheet contained detailed answers to the most frequently asked questions about the project including costs and projected savings.

A third strategy was to employ an Internet Web page giving an overview of the project. The Web page was used as a vehicle to provide a general collection and distribution point for e-mail inquiries about the project. It has maintained links to dozens of other biometric sites making detailed data available to all who are investigating this technology. In addition, in part because of the advanced nature of Connecticut's project, it has become the Internet forum for discussions on social services biometric projects and standards. In the most recent 13 month period, the Web page was visited over 11,075 times.

In 1998, PC Webopaedia an online encyclopedia dedicated to computer technology, selected the DSS Digital Imaging webpage as one of the top five Biometric sites on the World Wide Web.

The web page address is : **http://www.dss.state.ct.us/digital.htm**

A technology company in Bejing, China referred to DSS's digital imaging web page as being "… full of links to information on vision, hand, and other methods of biometrically identifying people. A must-see site for additional information in this exciting field."

Many articles have been written about Connecticut's system, appearing in trade publications, as well as many mainstream media outlets. They include:

Government Technology Magazine	March 1996
Governing Magazine	April 1996
APWA, This Week in Washington	April 12, 1996
Government Technology Magazine	April 1996
Card Technology Magazine	September/October 1996
BioCard International	November 1996
Automatic ID News, Europe	December 1996
Government Technology Magazine	March 1997
Information Week	August 18, 1997
New York Times	August 20, 1997
Canadian Business Magazine	September 1997
Card Technology Magazine	October 1997
Pioneer Press, St. Paul, MN.	November 17, 1997
Government Technology Magazine	May 1998

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In order to determine the effect of the mass enrollments and measure general acceptance of the enrollment and card issuance process by the client population, a simple survey was developed. A total of 327 clients were interviewed for this study. Client participation was voluntary. The interviews were done in Spanish and English.

What follows are six questions asked and the responses received as part of that study

1. *Have you been inconvenienced in any way because of the finger imaging process?*

Response: 88.4% felt they had not been inconvenienced

2. *Have you had to ask any questions about the finger imaging program to the DSS staff?*

Response: 7% had to ask questions about the process

3. *How do you feel about being fingerimaged in order to receive benefits?*

Response: 85.1% did not object to the process

4. *Do you think finger imaging will help prevent people from cheating in order to receive benefits?*

Response: 87.1% felt that the process would help prevent people from cheating

5. *Do you know of anyone who was prevented from cheating because of finger imaging?*

Response: .6% actually said <u>they knew of someone who was prevented from cheating due to the digital imaging project</u>

6. *Do you like the new client identification card?*

Response: 88.3% liked the new client identification card

We would also note that, to date, there have been no legal or other formal challenges to Connecticut's system.

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Interstate matching

DSS regularly conducts interstate matches using basic client identifying data. The Digital Imaging System will for the first time allow an interstate match based upon a unique biometric identifier. New York and New Jersey DSS's were contacted to determine their willingness to participate. Each are willing partners in what will become the first interstate match of human services files in the United States using biometric identifiers only.

Within the last month the interstate match of biometric finger imaging data has been completed between Connecticut and New Jersey. The comparison was based upon Connecticut's entire AFIS database and New Jersey's 46,000 record "home relief" program (GA) database. Our initial effort in matching with the state of New Jersey yielded the identification of 53 recipients that are known to both systems based upon finger image comparisons alone. Our fraud investigation division is currently involved in a cooperative investigation with New Jersey in determining overlaps of benefits and other details that will determine whether or not these individuals will be prosecuted. We expect to conclude the matches with New York by mid 1998.

To date, 32 individual cases have been identified attempting dual enrollments and were referred to our client fraud unit for investigation. Twelve cases have been processed resulting in prosecution, closure or other administrative action. Twenty are pending completed investigations at this time. A total of 1,548 matches were resolved administratively by the digital imaging special investigations unit technician. These matches did not result in client fraud referrals.

For large scale positive identification applications, no other currently available technology comes close to finger imaging. Fingerprint identification technologies are well established, proven, legally accepted and mature as an industry. The proliferation of plain impression finger imaging systems is rapid and accelerating at the state and federal level. We see it in large scale applications including welfare, driver's licensing, border control, immigration and military personnel identification.

Matching finger images between states is based upon a data exchange which includes gray scale images of the finger prints. The portions of industry standards that apply to this exchange include ANSI/NIST 1993 scanning densities of 500dpi, 8 bit gray, and WSQ Compression. New York, New Jersey and Connecticut's systems meet this basic standard and are compatible. The tri-state agreement will also serve to set and reinforce future standards for all other interstate matching.

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One of the functions of the Digital Imaging System was to serve as the first statewide General Assistance Database. Prior to the installation of the system, Connecticut's 169 towns had no uniform way of tracking General Assistance activity on an individual case basis. A few of the larger towns have automated systems. None of the systems communicated with each other. None were capable of sharing participation data from one town to another. The only existing participation reporting tool is a quarterly report sent from each town to DSS that is non client specific.

The Digital Imaging System contains 18 different General Assistance client specific data elements. The following are the major GA data elements:

- The Town Identification Number

- The Client's Full Name

- An Alias Name (If Applicable)

- The Client 9 Digit EMS Identification Number

- The Client's Social Security Number

- The Client's Date Of Birth

- The Client's Sex

- The Current Status of The Case (Active, Closed, Suspended, Denied)

- The Type of Assistance Rendered (Financial, Medical, etc.)

- Date Town Assistance Begins

- Date Town Assistance Ends

Utilizing all of the information collected, the first trial statewide reports were issued in November 1996 to individual GA towns. Towns with verification workstations installed are able to update and maintain the data on their recipients via dial up lines. Other towns without this equipment fax updates and changes to the contractor, whose staff enters the changes on the AFIS system.

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General Assistance Enrollment Impact

As DSS began the enrollment process for all General Assistance recipients beginning February 1, 1996, the expected enrollments for this program group totaled 22,198. For the two months prior to mass enrollment of this group, DSS gathered pre-enrollment data on this entire group and assigned them DSS/EMS (Eligibility Management System) identification numbers. On May 13, 1996 enrollments had been completed for this group. The state's 169 general assistance organizations were instructed not to issue benefits to any individual who did not have one of the new Digital Imaging biometric identification cards.

Preliminary system reports indicate that 7,568 failed to register by 12/31/96. Based upon a review of the four largest municipalities, considerable savings were achieved. Savings estimates are based upon an average monthly GA flat grant ($272) and the average length of stay on G.A. (8.1 months).

A scientific sample selected from and reviews conducted in the following 4 cities yielded the following projected results:

City	Projected Savings
Hartford	$ 535,378
Bridgeport	$ 713,837
New Haven	$ 638,928
Waterbury	$ 383,357
Total for 4 cities	**$ 2,271,500**

Based on accepted extrapolation methods we are estimating *initial annual savings in the General Assistance Program alone at* **$3,776,206.** With the state takeover of General Assistance early in 1997, savings for that year are included under the TFA programs.

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TFA Enrollment Impact

When legislation was first considered, federal requirements did not specifically address what format administrative sanctions would take for a client's failure to enroll in the imaging program. It was assumed that the entire assistance group would be disqualified. Subsequently, DSS was informed by HHS that only the adult individuals refusing to participate could be sanctioned. This would obviously impact the original savings estimates.

DSS began enrollments at our Hartford Regional office on January 22, 1996. We preloaded the Digital Imaging database with all eligible adult members of DSS's TFA program. Preliminary reports indicate the following.

At the start of enrollments 54,616 TFA recipients were required to enroll. Of this group 9,900 failed to register by 12/31/96. Of the 9,900 group 6,359 left the active assistance rolls.

Administrative action in the form of benefit reductions or discontinuances were taken on 3,541 cases.

During 1997, 1,072 TFA and SAGA cases were sanctioned.

Method of TFA Savings projections:

Savings calculation formula:

(Number of cases affected) X (Average reduction in award) X (Number Of Months Case would have remained active)

Because savings are calculated based upon benefit reductions rather than case closures, a review of the cases processed showed that the average monthly benefit reduction per case was $106. Under Connecticut's current welfare reform plan, client's time on assistance will be reduced to 21 months. Prior to Temporary Assistance To Needy Families, DSS's studies showed the average time on assistance for an AFDC recipient was 3.4 years. We estimated that participants may have already been on the program for at least 6 months so the savings estimate is based upon a reduced time period of 15 months (21 - 6 = 15).

Savings could then be calculated in this manner:

1996

	3,541	Individuals who refused to comply
	15	Average Months
=	53,115	Months saved
X	$ 106	Dollars per month
	$5,630,190	**Estimated Savings Projection**

1997

	1,072	Individuals who refused to comply
	12	Average Months
=	12,864	Months saved
X $	469	Dollars per month

$6,033,216   **Estimated Savings Projection**

This does not include savings that could be realized by reductions in Title 19 participation . It also does not take into consideration the *deterrent effect* of the Digital Imaging System whereby clients choose not to participate. Savings due to this effect could not be extrapolated without an in depth analysis of the 6,359 cases who left the TFA assistance rolls during the mass enrollment period.

17.0   Recidivism Study

We do expect that, faced with the prospect of benefit loss, additional recipient compliance with the digital imaging process will occur. This phenomenon, as noted, is referred to as Recidivism.

Because of its deterrent effect, recipients may choose not to participate in these programs and not be enrolled in the digital imaging system for any number of reasons not related specifically to double dipping. After a period of months, these recipients may return to the active assistance rolls. DSS determined that an ongoing measurement of this effect would be appropriate. We have developed analysis tools in our system to measure this factor. The firm of Ernst & Young LLP was retained by the State of California to evaluate the results of that state's experience with a similar program. They found that after time, due to recidivism, the actual discontinuance or sanctioning rate was reduced to a little more than 2% of the original enrollment population. If Connecticut realizes similar results, the savings for DSS will be substantial.

Chart on Recidivism to date:

Program	AFDC	GA
Pre- enrollment	54,616	22,198
No Shows as of 9/96	13,024	7,932
No Shows as of 12/96	9,900	7,568
No Shows as of 8/97	6,822	6,679
No Shows as of 2/98	5,702	6,007

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Toll Free DSS Fraud Hotline (800) 842-2155

As the first state to have a completely operational state-wide system, Connecticut has become one of the pioneers in the implementation of this new technology. Our system has generated a great deal of interest in other states who are also interested in this unique welfare reform effort. On site inspections of the system have been made by some of these other states. Governmental organizations from as far away as South America have also made the trip to Connecticut to see the system in operation.

In May 1996, Connecticut's system was highlighted in a presentation at a major industry conference in Atlanta Georgia. In October 1996, the system was highlighted in a presentation at a Government '96 technology conference in Arlington, Virginia. On January 29, 1997, Connecticut's system took center stage at the "Advanced Card Technology Conference '97" in Los Angeles. On May 19, 1997 the Digital Imaging System was highlighted at the international "Art of Implementation" CardTech SecurTech conference in Orlando, Florida. September 16, 1997 highlighted the project at the "Government '97" conference in Washington, D.C. Also in September, Connecticut's experience was shared at the "Auto ID Conference '97" held in Milpitas, CA. In April, 1998, Connecticut's system will be represented at an advanced technology workshop, held at the Washington, D.C. "Symphony of Solutions" conference.

Connecticut was instrumental in the formation of The Biometrics in Human Services User Group (BHSUG). BHSUG is the first organized users group for government users of biometric systems. Membership is already international in scope. The user group is open to all state, federal, provincial, educational or other governmental organizations interested in keeping pace with the latest developments in the biometrics field. The focus of BHSUG is providing a platform for sharing ideas and innovations, distributing findings, identifying best practices, and recommending and creating useful standards for human services users of this technology. A quarterly newsletter receives wide distribution via the Internet and gives participants a broad range of application development data, first hand experiences and other insights.

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Next Steps

DSS will conduct focused individual eligibility determination reviews on those TFA recipients whose benefits were reduced for failure to cooperate with the digital imaging requirement. It is expected that further savings may be achievable in other program areas where those recipients are receiving assistance from the department.

Connecticut belongs to a working group known as the North East Coalition of States made up of the social services Commissioners. At a meeting in August of 1995, agency heads agreed to meet periodically on common issues among all of the member states. At these meetings, fraud initiatives, best practices, technology sharing as well as other cost savings plans are discussed. Member states currently include Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

Member NCS states with finger imaging systems have agreed to work together cooperatively to pursue Coalition Matches

One of the options available to DSS in future contracts is the possibility of a multi-state approach. Connecticut's recent participation in the NCS EBT RFP and contract process has resulted in extensive savings in EBT costs, rendering it cost-neutral for DSS. This is primarily due to the significant numbers of transactions inherent in multi-state participation. The NCS EBT success can be mirrored in the finger imaging arena. Inherent in the multi-state approach is the possibility of immediate matching capability without added interstate tape or data transfers. Another benefit of multi-state participation would be to improve the realization of the ability to accurately measure a recipients length of participation in TANF or other programs with lifetime limits.

NCS representatives from our neighboring states enthusiastically agreed to explore this option at a recent meeting in Albany New York. The Southern Association of States (SAS) also conducted positive discussions of the same nature at an SAS meeting focused on biometric identification systems held in Missouri in December 1996.

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Glossary of Terms

1:many	A comparison of a single biometric record to a large database of similar records. This process is often referred to as a "cold search".
1:one	A comparison of a single biometric record to another single biometric record.
2D Bar Codes	Unlike the bar codes currently found on food items and other types of packaging that are made up of a grouping of vertical lines (One dimensional), 2D Bar Codes are two dimensional, containing a much larger repository of information.
AFDC	Aid To Families With Dependent Children (Replaced by TANF, 10/96).
AFIRM	Automated Fingerprint Image Reporting and Match - System installed in Los Angeles California.
AFIS	Automated Finger Imaging System.
ANSI	American National Standards Institute (U.S. Gov't.)
ATM	Automated Teller Machine.
BHSUG	Biometrics In Human Services User Group.
Biometric	Adjective, taken from the noun "biometry", which is the statistical analysis of biological observations or phenomena.
CAFIS	California Automated Finger Imaging System
Coercivity	The property of a material determined by the value of the coercive force when the material has been magnetized to saturation.
Digital Imaging	The use of digitized images. In Connecticut's system, digital photos, digital signatures and digitized fingerprints are utilized.
DPI	Dots per inch.
Dual Enrollments	The use of false identities to obtain more than one public assis tance benefits inappropriately
EBT	Electronic Benefit Transfer.

Eyescan/ Retinal Scan	A biometric process whereby an enrollee's retina is scanned producing a unique map of a person's retinal vein structure as well as other retinal biological observations or phenomena. Each person's retinal map is unique.
Facial Imaging	A biometric process by which digital photographs are converted into digital "eigenface calculations" based upon measurements of facial features.
Finger Imaging	A biometric process by which fingerprints are scanned, identifying features (minutiae) are extracted and measurements of the minutiae points relative to each other are mapped for comparison. Very large databases of finger images can be rapidly searched for exact duplicates.
GA	General Assistance, a state funded town administered program.
GAO	General Accounting Office (U.S. Gov't.)
Hand Geometry	A biometric process by which a persons hand is scanned, identifying biological features and phenomena that is unique to each individual.
Internet Web Page	A logical site or address on the World Wide Web, primarily used for dissemination or collection of information.
Interstate Match	A comparison of enrolled clients in one or more states.
Mag Stripe	A magnetic stripe adhered to the back of an ISO standard card. It can be digitally encoded with identifying data for financial trans actions or other uses.
Minutiae	In the classification of fingerprints, minutiae points are identifiable intersections of ridges, ridge endings, etc. These can be mathematically located and plotted. No two fingers contain identical minutiae points rendering each individual as unique, even twins.
NIST	National Institute Of Standards and Technology (U.S. Gov't.)
ORC	Opinion Research Corporation (Princeton, NJ.)
PARIS	Pennsylvania Automated Recipient Identification System.
PIN	Personal Identification Number.
Recidivism	A tendency to relapse into a previous condition.

Signature Verification	Automated computer analysis of signatures for verification of identity.
SQL	Structured Query Language.
TANF	Temporary Assistance To Needy Families (Replaced AFDC 10/96)
Verification	In biometrics, the ability to confirm an individual's identity based upon a biometric identifier.
Voice Recognition	Considered a biometric process by which a person's voice is digitally captured and used for comparison and identification.
Workstations	A grouping of computer components designed to work together as a unit to gather and process digital data.
WSQ Compression	Wavelet scalar quantization, gray scale compression for finger images.

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