Existing Capabilities

ANSI/NIST-ITL 1-2011

Latent Friction Ridge Prints

Figure 23: Latent image with multiple discontinuous areas

Extended Feature Set Markups

- Cores
- Deltas
- Distinctive Characteristics
- Minutiae
- Dots
- Incipient Ridges
- Creases & Linear Distortions
- Ridge Edge Features
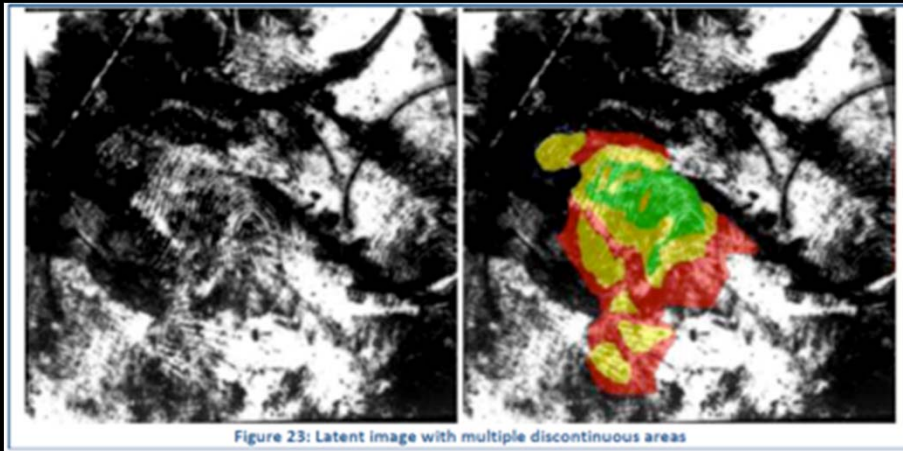- Pores & Ridge edge fields

-- Automated Matching

-- Forensic Analysis & Comparison

Body Images

Face

Prior -- Ante-mortem:

*   Passport, driver license, family photos, etc.

*   Try to get frontal and fairly recent

Post-mortem or for living amnesiacs:

*   All angles

 Mark eye locations using 2D markups

-- Automated Matching
-- Forensic Analysis & Comparison

Other Parts, Scars, Tattoos, Injuries

Prior -- Ante-mortem:

*   As available

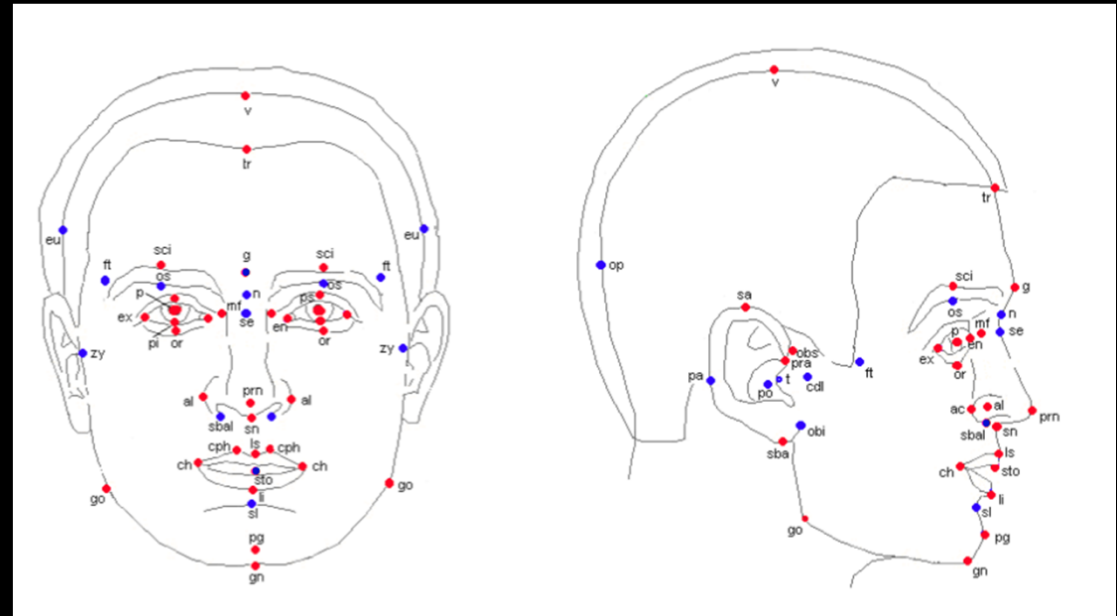*   Distinctive features (e.g. club foot, extra finger, broken nose, etc.)
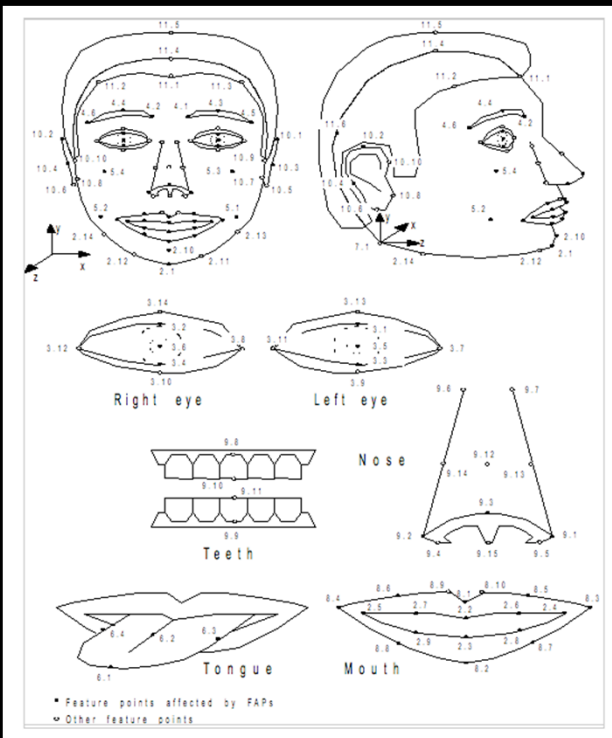
Post-mortem or for living amnesiacs:
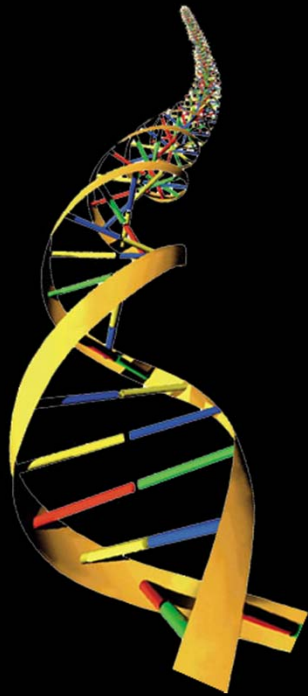
*   With ruler

-- Forensic Analysis & Comparison

Image Markups

- Forensics:
  - 2D and 3D anthropomorphic facial image markup fields

DNA

- Rapid DNA and Laboratory Processing
- Pedigree tree
  - Claimed and Validated relationships
  - Data on victim and relatives in one transaction
- X-STR, Y-STR, Mitochondrial
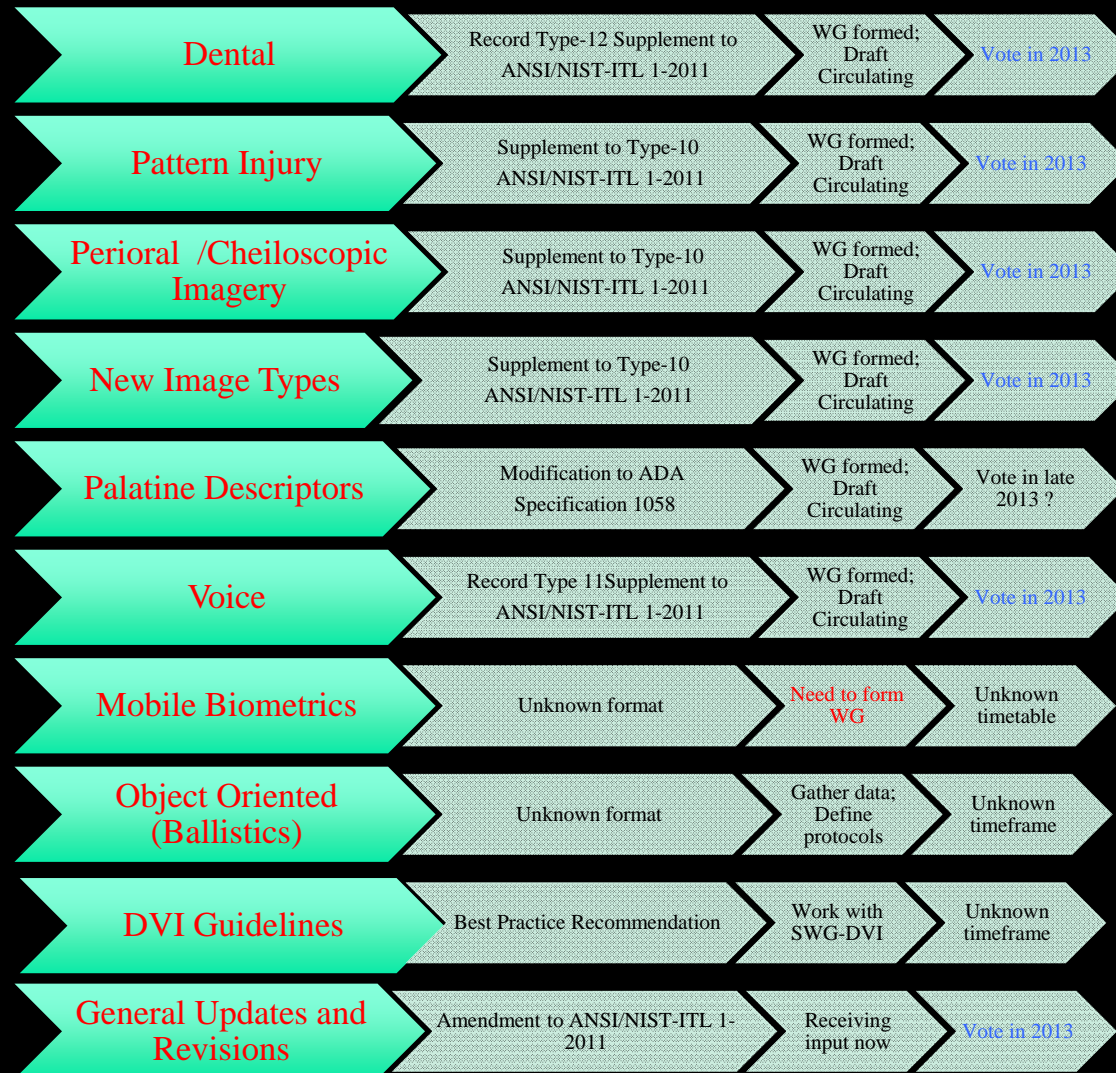
Conformance Test Tools

BioCTS AN-2011

Biometric Conformance
Test Software for
ANSI/NIST-ITL 1-2011
(AN-2011) Transactions*

- Test assertions based on NIST SP 500-295
  - CTM for AN-2011
- Tests for selected Record Types in traditional encoding:
  - Installer
  - Command Line Interface
- Under development: tool to test XML encoding

What more do we need to do?

Combined in one Supplement

Dental	Record Type-12 Supplement to ANSI/NIST-ITL 1-2011	WG formed; Draft Circulating	Vote in 2013
Pattern Injury	Supplement to Type-10 ANSI/NIST-ITL 1-2011	WG formed; Draft Circulating	Vote in 2013
Perioral /Cheiloscopic Imagery	Supplement to Type-10 ANSI/NIST-ITL 1-2011	WG formed; Draft Circulating	Vote in 2013
New Image Types	Supplement to Type-10 ANSI/NIST-ITL 1-2011	WG formed; Draft Circulating	Vote in 2013
Palatine Descriptors	Modification to ADA Specification 1058	WG formed; Draft Circulating	Vote in late 2013 ?
Voice	Record Type 11Supplement to ANSI/NIST-ITL 1-2011	WG formed; Draft Circulating	Vote in 2013
Mobile Biometrics	Unknown format	Need to form WG	Unknown timetable
Object Oriented (Ballistics)	Unknown format	Gather data; Define protocols	Unknown timeframe
DVI Guidelines	Best Practice Recommendation	Work with SWG-DVI	Unknown timeframe
General Updates and Revisions	Amendment to ANSI/NIST-ITL 1-2011	Receiving input now	Vote in 2013

Dental Forensics?

Identify deceased individuals when facial features and / or fingerprints are not available or DNA cannot be matched

- Decomposition of soft tissue

- Extreme trauma

- Co-mingling of samples in a mass disaster

Of the victims identified in Phuket, nearly 75% were traced through dental records, about 15% through fingerprints and 10% through a combination of the two. Just a fraction was identified through DNA.

Above statistics from: Triodent, June 2011, *Dentistry still plays most vital role in victim identification*

Dental Working Group

- Dental Forensics
  - Working with the American Dental Association to base Type-12 record upon their Spec 1058
  - Meetings held in Argentina, Washington, D.C., New York (with SWG-DVI), Lyon (with INTERPOL), Atlanta (with AAFS), and San Francisco (with ADA)
  - FBI has done the update to the ANSI/NIST-ITL XML schema for the current draft
  - Will be presented as a supplement to ANSI/NIST-ITL 1-2011 for voting

Dental Forensics

Draft available at
http://www.nist.gov/itl/iad/ig/ansi_standard_dental_forensics.cfm

Based on ADA Specification 1058

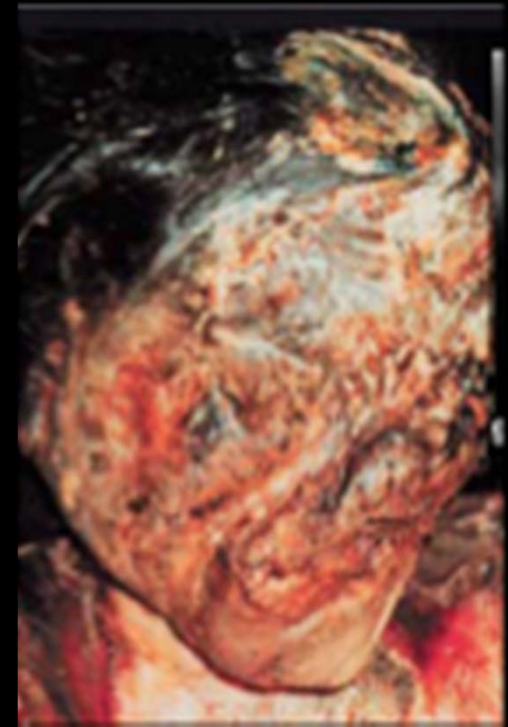Familial Data Set

Dental History Data Set

Tooth Data Set

Mouth Data Set

Visual Image Data Set

Radiograph Image Data Set

Includes DICOM data & images (Electronic Health Record)

Key Challenges : Dental Forensics

Teeth numbering not the same in US and other nations

    Decision: Use ISO standard for transmission

Dental Forensic Systems all use different data definitions and levels of detail

    Decision:

        *   Use the ADA Spec 1058 as a 'translator'

        *   State the level of aggregation for each system (i.e. NamUS, WinID, NCIC, UDIM, Plass & FastID)

        *   Include original encoding with transmission to help resolves ambiguities

Pattern Injury

New Fields added to Type-10

Field 10.046: Victim / VIC
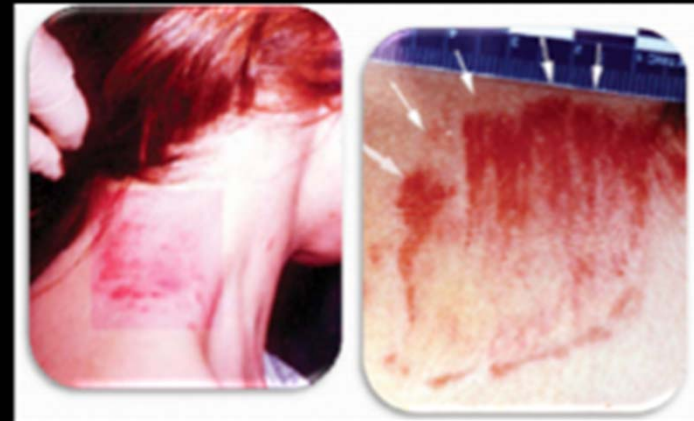
current subject status

living

deceased

unknown

body status

Class 1 Natural Tissue (Whole or Fragment)
Class 2 Decomposed (Whole or Fragment)
Class 3 Skeletal (Whole or Fragment)

Field 10.047: Data collection organization / DCO

LIVING

Pattern Injury

Field 10.048: Pattern injury description

Image location (using NCIC codes to define body parts)

Type of injury (Avulsion, laceration, etc.)

Color of injury

Surface contour

Shape and size (measured using 2D ABFO ruler)

Tissue characteristics

Underlying structure

Possible cause (human, animal, object, etc.)

Perioral / Cheiloscopic

Recommend use of Field 10.029: 2D facial feature points / FFP to indicate features of the lip print when sending an image of the lips of the possible suspect.

Add new code to Table 58 (Type-10 image types) as Perioral.

Modify Field 10.040 NCIC SMT code to use the NCIC codes to specify location of the lip print on the victim's body.

Include information about common cheiloscopic classifications
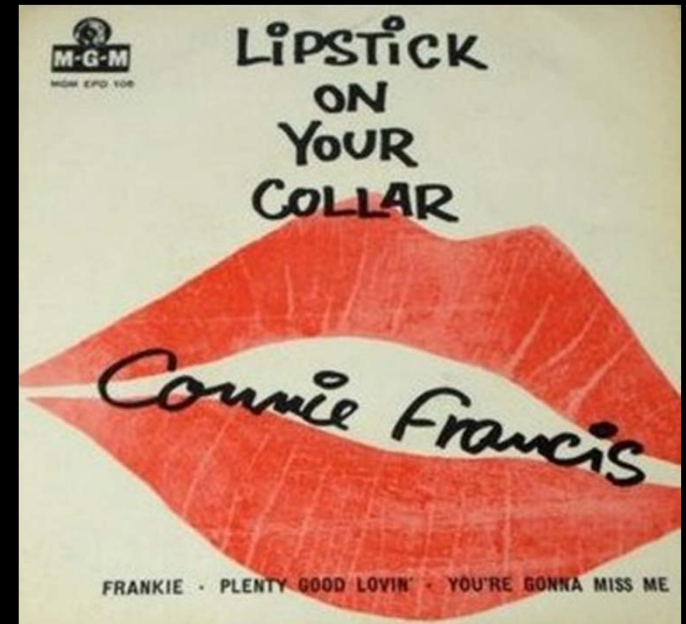
New Image Types

Modify Field 10.012 Color space / CSP to include more possibilities than currently (grayscale, color and undefined)

Sonogram

Radiograph (X-ray), including CT scans

and cone-beams

Magnetic resonance image (MRI)

Palatine Descriptors

Problem: ADA Mouth Data Set does not include descriptors for dental arch, rugae ramification or shape.

Solution:

Initiate a revision to ADA specification 1058 instead of adding descriptors to ANSI/NIST-ITL in the Supplement.

Impact:

Descriptors will not be included initially when Dental Supplement is adopted. Expected to take more than a year.

Forensic Voice

For investigatory and forensic uses
    not intended for applications like access control

Includes audio recordings, as well as related information
    diarization (when speech occurs during the recording)
    transcription (what is said)
    redaction annotation ('bleeping' of portions –
        sometimes required by legal authorities)
    snipping annotation (cutting out portions of a longer recording)
    audio characteristics (recording device, CODECs, etc.)
    geographic location of speakers and recording device(s)
    speaker characteristics (impairment, language, etc.)

Example: Compare a recording of a ransom call in a kidnapping case
    against known voice samples of suspects
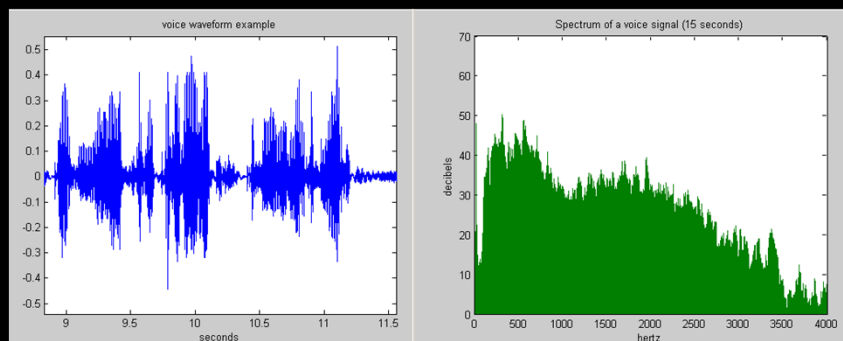
Mobile Biometrics

Mobile ID Best Practice Recommendation (BPR)

   * issued in 2009

   * defined subject acquisition profiles

   * defined military and law enforcement profiles

   * requires use of ANSI/NIST-ITL standard

ANSI/NIST-ITL 1-2011

   * incorporates key points of the BPR

Technological advancements and modified operational needs suggest that a new document is needed

Key point: What type?

ANSI/NIST-ITL LITE

Figure 1
SEPARATE MOBILE UNITS COLLECTING DATA ON THE SAME PERSON IN DIFFERENT PLACES AND/OR TIMES

Concept 1

- In this example, two units may be used in the field -- independently or together: a 3 modality biometric capture device and a Rapid DNA device.

- Due to limited bandwidth or because operators are not to type in data in the field, the samples are sent with minimum packaging to a local unit, where more information is added to the transaction(s). That is then forwarded to a central site where the normal ANSI/NIST-ITL transaction is formed with all required information. This allows interoperability between systems and organizations to be maintained.
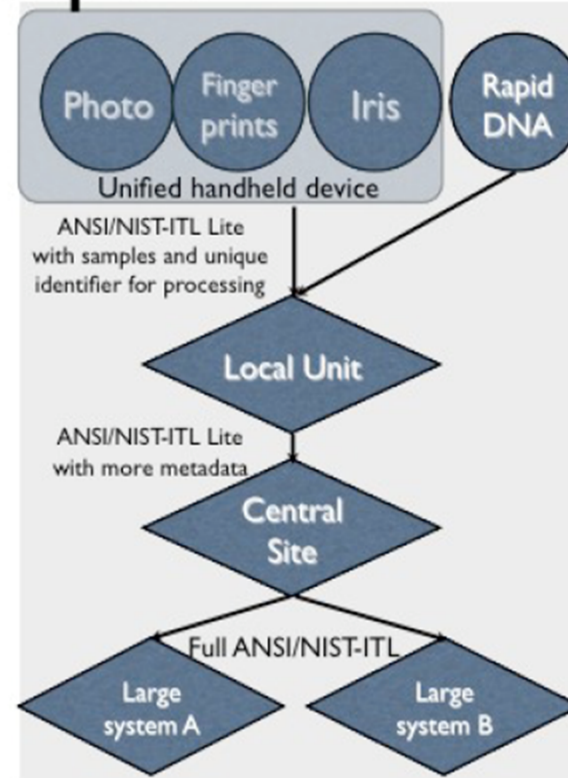
Concept 2

Figure 2
Rapid Identification with Limited Bandwidth

- The interactions with the field unit would be with minimum payload

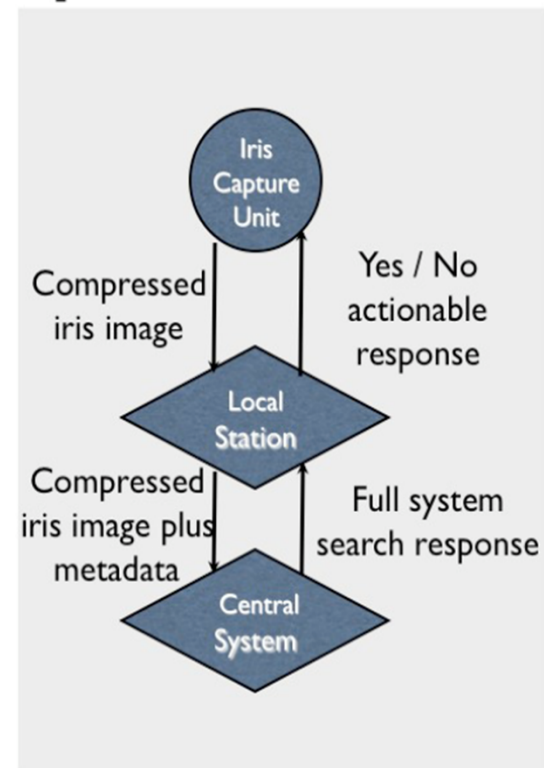- The local station composes an ANSI/NIST-ITL formatted transaction for submission and handles the response

Concept 3

Figure 3
Capture Modules Physically Separated from Control Unit

- In this case, the biometric capture devices are operated from a control unit using Web Services for Biometric Devices

- Data is provided to the base station using ANSI/NIST-ITL Lite

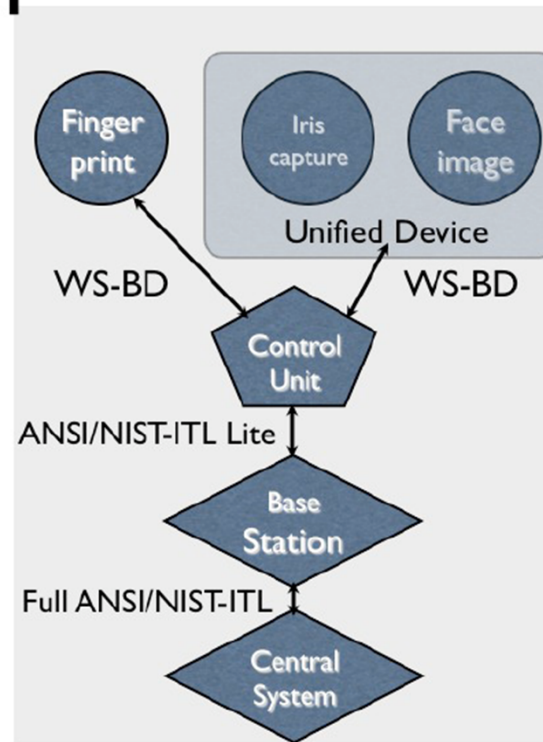- Base station interacts with the Central System using the full ANSI/NIST-ITL

Figure 4
Mobile Modules Communicating to Different Systems

Concept 4

- In this case, the biometric capture devices send biometric samples and basic information to two base stations using ANSI/NIST-ITL Lite

- Base stations prepare full transmission using the full ANSI/NIST-ITL format for database search

- System A also sends data to System C using the full ANSI/NIST-ITL format.
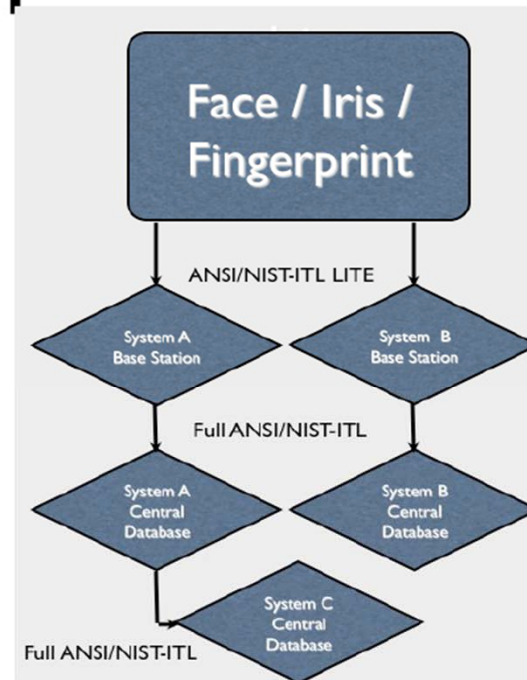
Object Oriented Data

Bullets   and   Cartridges

Issue: Advances in imaging analysis are making new approaches to identification of weapons or classes of weapons more accurate (i.e. 3D topographic data)

Need: Databases for matcher system development and initial testing as well as for sequestered testing (much like is usually done at NIST)

Problem: How to receive the data (transmission protocols) and how to make it accessible
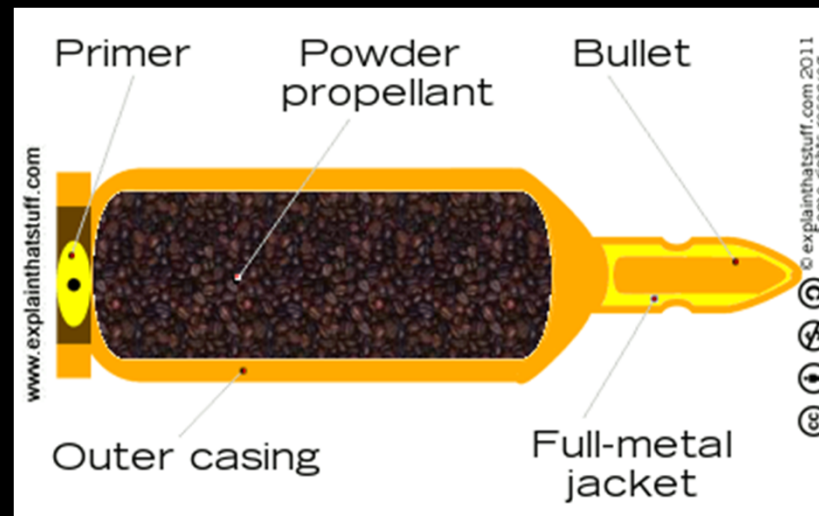
Disaster Victim Identification Procedures using ANSI/NIST-ITL for data transmission

Issue:

Data to be received from around the world

Fingerprints, Facial images, Dental records, DNA samples

Data to be collected together relating to a subject and updated as needed (i.e. pedigree trees and established relationships)

Medical examiners & disaster recovery teams have not worked with police departments to transmit data in ANSI/NIST-ITL format

Solution:

Develop a Best Practice Recommendations document

NEW PROPOSAL

2013/2014: Prepare interfaces based upon standard

2014: Demonstration at ADA meeting of a simulated disaster with to show receiving information from New York, overseas, INTERPOL to the conference and entering it into NCIC, NamUs, WinID and checking results

- focus on dental data exchange

- 2015: Data-exchange simulation of a disaster, to commemorate the 10th anniversary of Katrina

- include capabilities for DNA (including Rapid DNA), fingerprints, as well as dental

WORKSHOP ON PROPOSED CHANGES TO ANSI/NIST-ITL STANDARD at NIST

Monday January 28

09:00 – 10:00   Welcome and overview of the ANSI/NIST-ITL

current status and the standards development process
10:00 – 10:30   NIEM and the XML Biometrics Domain
10:30 – 11:00   List-driven Programming
11:00 – 12:00   Ballistics Discussion
13:00 – 17:00   Forensic Voice Supplement Discussion

Tuesday January 29

09:00 – 12:00 Mobile ID Discussion
13:00 – 17:00 Mobile ID Discussion

Wednesday January 30

09:00 – 12:00 Dental Forensics Supplement Discussion
13:00 – 15:00 Disaster Victim Identification Best Practices
15:00 - 17:00 Open Forum

● FOR FURTHER INFORMATION:

HTTP://biometrics.NIST.Gov
& click for the standard's page
Or
Brad.Wing@NIST.GOV