

ITL 2011 Change Log

Overview of Changes

The changes made to the ANSI/NIST ITL schemas to upgrade them from 2-2008 to 2011 are as follows:

1. ITL-2008-Package-Annex-B.xsd has become itl.xsd and given a new namespace.
2. ansi-nist.xsd has become biometrics.xsd and given a new namespace. Only elements used in the ITL 2008 specification were moved over.
3. All ISSUE 39 and schema/instance-related ISSUE 38 items were addressed, including:
 - a. NIEM conformance issues were fixed, including documentation and naming.
 - b. A true NIEM subset was created, that only contains the elements used in the exchange.
4. The corrections of ansi-nist.xsd elements and their types that appeared in the ITL schema were moved into the biometrics domain schema, with a deprecated copy of the elements left in the ITL schema.
5. Elements identified as deprecated in the base specification were removed (Types 3, 5 and 6, and field 17.018.)
6. Elements identified as "legacy" in the base specification were retained but marked as "deprecated" in the NIEM sense (fields 9.005 through 9.012, and field 10.022).
7. All elements and their valid values and cardinalities were rechecked against the Part 1 and 2 narratives and a few anomalies were corrected.
8. Example extension elements were moved from the ITL schema into a separate schema, example-extension.xsd.

The Transformation Guidance section below contains a list of changes to elements that affect ITL instances (and therefore implementors and users).

Transformation Guidance

This section lists, element by element, the changes in the XML instances between version 2-2008 and 2011. It is intended to provide a list of changes that affect processing of ITL instances, and serve as guidance for transforming between versions.

The columns in the table in this section are as follows:

Field ID - The numeric identifier of the field.

Old Element Name - The element name used in 2-2008.

New Element Name - The element name used in 2011. Note that in this column, the "itl" prefix refers to the new ITL namespace name, <http://biometrics.nist.gov/standard/2011>

Type of Change:

- Namespace - the namespace name changed
- Name - the name changed
- Contents - the allowed values changed
- Cardinality - the cardinality changed
- Deprecation Status - the element was deprecated
- Deleted - the element was deleted

Change Reasons:

- 1 - Upgrade from old itl namespace to the new itl namespace
- 2 - Upgrade from the old ansi-nist namespace to new biom namespace
- 4 - Change from the old itl namespace to the new biom namespace (for "corrections")
- 5 - NIEM conformance
- 6 - Changes (new additions, deprecation/deletion) for version 2011
- 7 - Contents made more strict (according to values allowed in the 2008 spec) to strengthen the schema
- 8 - Incompatibility between ITL parts 2007-1 or 2008-2 narrative and the XML artifacts

Compatible?

- N - Not backward compatible; 2008 instances will not validate against 2011 schema
- N1 - Not backward compatible by reason of namespace name; 2008 instances will validate against 2011 schema if namespace names are changed
- Y - Backward compatible; 2008 instances will validate against 2011 schema
- Y2 - Backward compatible with the letter of the 2008 specification, if not the schema. In other words, if a version 2008 document followed the narrative of Part 2-2008 as well as its schema, it is backward compatible.
- Y3 - Backward compatible because it's abstract, and therefore only used in the schema

Notes - Explanatory notes.

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
Type 1	itl:PackageInformationRecord	itl:PackageInformationRecord	Namespace	1	N1	
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
-	ansi-nist:Transaction	biom:Transaction	Namespace	2	N1	
1.005	ansi-nist:TransactionDate	biom:TransactionDate	Namespace	2	N1	
1.007	ansi-nist:TransactionDestinationOrganization	biom:TransactionDestinationOrganization	Namespace	2	N1	
1.008	ansi-nist:TransactionOriginatingOrganization	biom:TransactionOriginatingOrganization	Namespace	2	N1	
1.014	ansi-nist:TransactionUTCDate	biom:TransactionUTCDate	Namespace	2	N1	
1.009	ansi-nist:TransactionControlIdentification	biom:TransactionControlIdentification	Namespace	2	N1	
1.010	ansi-nist:TransactionControlReferenceIdentification	biom:TransactionControlReferenceIdentification	Namespace	2	N1	
1.013	ansi-nist:TransactionDomain	biom:TransactionDomain	Namespace	2	N1	
"	ansi-nist:DomainVersionNumberIdentification	biom:DomainVersionNumberIdentification	Namespace	2	N1	
			Cardinality	8	Y	min occurrences loosened to 0
"	ansi-nist:OrganizationName	biom:TransactionDomainName	Namespace	2	N1	
			Name	5	N	reuse - must use the existing OrganizationName in NIEM (or create different element)
			Cardinality	8	Y2	min occurrences constrained to 1
-	ansi-nist:TransactionImageResolutionDetails	biom:TransactionImageResolutionDetails	Namespace	3	N1	
1.011	ansi-nist:NativeScanningResolutionValue	biom:NativeScanningResolutionValue	Namespace	2	N1	
1.012	ansi-nist:NominalTransmittingResolutionValue	biom:NominalTransmittingResolutionValue	Namespace	2	N1	
1.002	ansi-nist:TransactionMajorVersionValue	biom:TransactionMajorVersionValue	Namespace	2	N1	
1.002	ansi-nist:TransactionMinorVersionValue	biom:TransactionMinorVersionValue	Namespace	2	N1	
1.006	ansi-nist:TransactionPriorityValue	biom:TransactionPriorityValue	Namespace	2	N1	
1.004	ansi-nist:TransactionCategoryCode	biom:TransactionCategoryCode	Namespace	2	N1	
		--possible user-defined substitute--	New element	8	Y	to allow implementations to customize the transaction types
			Cardinality	6	Y	min occurrences loosened to 0
1.003	ansi-nist:TransactionContentSummary	biom:TransactionContentSummary	Namespace	2	N1	
"	ansi-nist:ContentFirstRecordCategoryCode	biom:ContentFirstRecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the value 1
"	ansi-nist:ContentRecordCount	biom:ContentRecordQuantity	Namespace	2	N1	
			Name	5	N	"Quantity" is the approved

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
						representation term
"	ansi-nist:ContentRecordSummary	biom:ContentRecordSummary	Namespace	2	N1	
"	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
"	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
1.015	ansi-nist:TransactionCharacterSetDirectory	biom:TransactionCharacterSetDirectory	Namespace	2	N1	
			Cardinality	6	N	max occurrences constrained to 1
"	ansi-nist:CharacterSetCommonNameCode	biom:CharacterSetCommonNameCode	Namespace	2	N1	
			Contents	6	N	Code values changed: "ASCII 7-bit English" becomes "ASCII". "ASCII 8-bit Latin" becomes "ASCII" (and is deprecated), "UNICODE 16-bit" becomes "UTF-16", "UTF 8-bit" becomes "UTF-8", new value "UTF-32" added
"	ansi-nist:CharacterSetIndexCode	biom:CharacterSetIndexCode	Namespace	2	N1	
			Contents	6	Y	Value 1 is deprecated, code 4 added.
"	ansi-nist:CharacterSetVersionIdentification	biom:CharacterSetVersionIdentification	Namespace	2	N1	
1.016			New elements	6	Y	<i>New elements; see specification for details</i>
Type 2	itl:PackageDescriptiveTextRecord	itl:PackageDescriptiveTextRecord	Namespace	1	N1	
			Cardinality	6	Y	min occurrences loosened to 0
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
2.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
-	itl:UserDefinedDescriptiveText	itl:UserDefinedDescriptiveDetail	Namespace	1	N1	
			Name	5	N	complex element cannot use representation term "Text"
			Cardinality	8	Y	min occurrences loosened to 0
"	itl:DomainDefinedDescriptiveText	itl:DomainDefinedDescriptiveDetail	Namespace	2	Y3	
			Name	5	Y3	complex element cannot use representation term "Text"
"	itl:OtherDescriptiveText	itl:OtherDescriptiveDetail	Namespace	2	Y3	
			Name	5	Y3	complex element cannot use

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
						representation term "Text"
			Cardinality	8	Y	max occurrences loosened to *
Type 3	itl:PackageLowResolutionGrayscaleImageRecord		Deleted	6	N	
Type 4	itl:PackageHighResolutionGrayscaleImageRecord	itl:PackageHighResolutionGrayscaleImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:FingerprintImage
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
4.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
-	ansi-nist:FingerprintImage	biom:FingerprintImage	Namespace	2	N1	
4.009	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
4.005	ansi-nist:CaptureResolutionCode	biom:CaptureResolutionCode	Namespace	2	N1	
4.008	ansi-nist:ImageCompressionAlgorithmCode	biom:ImageCompressionAlgorithmCode	Namespace	2	N1	
4.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
4.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
-	ansi-nist:FingerprintImagePosition	biom:FingerprintImagePosition	Namespace	2	N1	
			Cardinality	8	Y2	occurrences constrained to 1..1
4.004	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Cardinality	8	Y2	occurrences constrained to 1..6
			Contents	6	Y	added value 15
4.003	ansi-nist:FingerprintImageImpressionCaptureCategoryCode	biom:FingerprintImageImpressionCaptureCategoryCode	Namespace	2	N1	
Type 5	itl:PackageLowResolutionBinaryImageRecord		Deleted	6	N	
Type 6	itl:PackageHighResolutionBinaryImageRecord		Deleted	6	N	
Type 7	itl:PackageUserDefinedImageRecord	itl:PackageUserDefinedImageRecord	Namespace	1	N1	
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
7.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
-	itl:UserDefinedImage	itl:UserDefinedImage	Namespace	1	Y3	
			Cardinality	8	Y	min occurrences loosened to 0

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
Type 8	itl:PackageSignatureImageRecord	itl:PackageSignatureImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:SignatureImage
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
8.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
-	ansi-nist:SignatureImage	biom:SignatureImage	Namespace	2	N1	
8.008	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
8.005	ansi-nist:CaptureResolutionCode	biom:CaptureResolutionCode	Namespace	2	N1	
8.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
8.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
8.008	ansi-nist:SignatureImageVectorRepresentation	biom:SignatureImageVectorRepresentation	Namespace	2	N1	
"	ansi-nist:SignatureImageVector	biom:SignatureImageVector	Namespace	2	N1	
"	ansi-nist:VectorPenPressureValue	biom:VectorPenPressureValue	Namespace	2	N1	
"	ansi-nist:VectorPositionVerticalCoordinateValue	biom:VectorPositionVerticalCoordinateValue	Namespace	2	N1	
"	ansi-nist:VectorPositionHorizontalCoordinateValue	biom:VectorPositionHorizontalCoordinateValue	Namespace	2	N1	
8.004	ansi-nist:SignatureRepresentationCode	biom:SignatureRepresentationCode	Namespace	2	N1	
8.003	ansi-nist:SignatureCategoryCode	biom:SignatureCategoryCode	Namespace	2	N1	
Type 9	itl:PackageMinutiaeRecord	itl:PackageMinutiaeRecord	Namespace	1	N1	
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
9.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
9.003	ansi-nist:MinutiaeImpressionCaptureCategoryCode	biom:MinutiaeImpressionCaptureCategoryCode	Namespace	2	N1	
			Contents	8	Y2	constrained to the code list allowed by the 2007 and 2011 specifications
9.004	ansi-nist:MinutiaeFormatNISTStandardIndicator	biom:MinutiaeFormatNISTStandardIndicator	Namespace	2	N1	
-	itl:RecordMinutiae	biom:RecordMinutiae	Namespace	1	Y3	
			Cardinality	6	Y	max occurrences loosened to *

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
-	itl:Minutiae	itl:Minutiae	Namespace	1	N1	
			Deprecation Status	6	Y	
-	itl:MinutiaeNISTStandard	itl:MinutiaeNISTStandard	Namespace	1	N1	
			Deprecation Status	6	Y	
9.012	itl:MinutiaDetail	itl:MinutiaDetail	Namespace	1	N1	
			Deprecation Status	6	Y	
"	ansi-nist:PositionHorizontalCoordinateValue	biom:PositionHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:PositionVerticalCoordinateValue	biom:PositionVerticalCoordinateValue	Namespace	2	N1	
"	ansi-nist:MinutiaIdentification	biom:MinutiaIdentification	Namespace	2	N1	
"	ansi-nist:PositionThetaAngleMeasure	biom:PositionThetaAngleMeasure	Namespace	2	N1	
"	ansi-nist:MinutiaQualityValue	biom:MinutiaQualityValue	Namespace	2	N1	
"	ansi-nist:MinutiaCategoryCode	biom:MinutiaCategoryCode	Namespace	2	N1	
			Deprecation Status	6	Y	
"	ansi-nist:MinutiaRidgeCount	biom:MinutiaRidgeCount	Namespace	2	N1	
			Deprecation Status	6	Y	
"	ansi-nist:RidgeCountReferenceIdentification	biom:RidgeCountReferenceIdentification	Namespace	2	N1	
"	ansi-nist:RidgeCountValue	biom:RidgeCountValue	Namespace	2	N1	
9.010	ansi-nist:MinutiaeQuantity	biom:MinutiaeQuantity	Namespace	2	N1	
9.005	ansi-nist:MinutiaeReadingSystem	biom:MinutiaeReadingSystem	Namespace	2	N1	
			Deprecation Status	6	Y	
"	ansi-nist:ReadingSystemCodingMethodCode	biom:ReadingSystemCodingMethodCode	Namespace	2	N1	
"	ansi-nist:ReadingSystemName	biom:ReadingSystemName	Namespace	2	N1	
"	ansi-nist:ReadingSystemSubsystemIdentification	biom:ReadingSystemSubsystemIdentification	Namespace	2	N1	
9.011	ansi-nist:MinutiaeRidgeCountIndicator	biom:MinutiaeRidgeCountIndicator	Namespace	2	N1	
			Deprecation Status	6	Y	
9.008	ansi-nist:MinutiaeFingerCorePosition	biom:MinutiaeFingerCorePosition	Namespace	2	N1	
			Deprecation Status	6	Y	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
9.009	ansi-nist:MinutiaeFingerDeltaPosition	biom:MinutiaeFingerDeltaPosition	Namespace	2	N1	
			Deprecation Status	6	Y	
9.007	itl:MinutiaeFingerPatternDetail	itl:MinutiaeFingerPatternDetail	Namespace	1	N1	
			Deprecation Status	6	Y	
"	itl:FingerPatternCodeSourceCode	itl:FingerPatternCodeSourceCode	Namespace	1	N1	
			Deprecation Status	6	Y	
"	ansi-nist:FingerPatternCode	biom:FingerPatternCode	Namespace	2	N1	
			Contents	5	N	Contents constrained to code list; representation term "Code" cannot be used with a text type
			Cardinality	8	Y	max occurrences loosened to *
			Deprecation Status	6	Y	
"		biom:FingerPatternText	New element	5	N	New (but deprecated) element introduced to handle user-defined values for FingerPattern; they can no longer be put in FingerPatternCode for NIEM conformance reasons.
9.006	ansi-nist:MinutiaeFingerPositionCode	biom:MinutiaeFingerPositionCode	Namespace	2	N1	
			Contents	5, 7	Y2	Contents constrained to code list; representation term "Code" cannot be used with a text type
"	ansi-nist:MinutiaePalmPositionCode	biom:MinutiaePalmPositionCode	Namespace	2	N1	
			Contents	5, 7	Y2	Contents constrained to code list; representation term "Code" cannot be used with a text type
			Deprecation Status	6	Y	
9.126+			New elements	6	Y	<i>New elements; see specification for details</i>
Type 10	itl:PackageFacialAndSMTImageRecord	itl:PackageFacialAndSMTImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow two image types: biom:FacelImage (and

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
						deprecated substitute) and biom:PhysicalFeatureImage
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
10.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
10.200	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	
- 10.900			Cardinality	8	Y	max occurrences loosened to *
-	itl:FacelImage	biom:FacelImage (or deprecated substitute itl:FacelImage)	Namespace	4	N1	
-	ansi-nist:PhysicalFeatureImage	biom:PhysicalFeatureImage	Namespace	2	N1	
10.999	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
10.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
10.016	ansi-nist:CaptureHorizontalPixelDensityValue	biom:CaptureHorizontalPixelDensityValue	Namespace	2	N1	
10.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	
10.017	ansi-nist:CaptureVerticalPixelDensityValue	biom:CaptureVerticalPixelDensityValue	Namespace	2	N1	
10.030	ansi-nist:CaptureDeviceMonitoringModeCode	biom:CaptureDeviceMonitoringModeCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to use the code values
10.012	ansi-nist:ImageColorSpaceCode	biom:ImageColorSpaceCode	Namespace	2	N1	
10.011	ansi-nist:ImageCompressionAlgorithmText	biom:ImageCompressionAlgorithmText	Namespace	2	N1	
10.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
10.009	ansi-nist:ImageHorizontalPixelDensityValue	biom:ImageHorizontalPixelDensityValue	Namespace	2	N1	
10.024	ansi-nist:ImageQuality	biom:ImageQuality	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
"	ansi-nist:QualityMeasureVendorIdentification	biom:QualityAlgorithmVendorIdentification (or deprecated substitute biom:QualityMeasureVendorIdentification)	Namespace	2	N1	
			Name	5	N	reuse - there were two elements with the same meaning
10.008	ansi-nist:ImageScaleUnitsCode	biom:ImageScaleUnitsCode	Namespace	2	N1	
10.003	ansi-nist:ImageCategoryCode	biom:ImageCategoryCode	Namespace	2	N1	
			Contents	6	Y	added values FRONTAL-C, REAR-C,

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
						FRONTAL-N, REAR-N, TORSO-BACK, TORSO-FRONT, CONDITION, MISSING, OTHER, CHEST, FEET, HANDS-PALM, HANDS-BACK, GENITALS, BUTTOCKS, RIGHT LEG, LEFT LEG, RIGHT ARM, LEFT ARM
10.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
10.010	ansi-nist:ImageVerticalPixelDensityValue	biom:ImageVerticalPixelDensityValue	Namespace	2	N1	
10.025	ansi-nist:FacedImage3DPoseAngle	biom:FacedImage3DPoseAngle	Namespace	2	N1	
"	ansi-nist:PosePitchAngleMeasure	biom:PosePitchAngleMeasure	Namespace	2	N1	
"	ansi-nist:PosePitchUncertaintyValue	biom:PosePitchUncertaintyValue	Namespace	2	N1	
"	ansi-nist:PoseRollAngleMeasure	biom:PoseRollAngleMeasure	Namespace	2	N1	
"	ansi-nist:PoseRollUncertaintyValue	biom:PoseRollUncertaintyValue	Namespace	2	N1	
"	ansi-nist:PoseYawAngleMeasure	biom:PoseYawAngleMeasure	Namespace	2	N1	
"	ansi-nist:PoseYawUncertaintyValue	biom:PoseYawUncertaintyValue	Namespace	2	N1	
10.013	ansi-nist:FacedImageAcquisitionProfileCode	biom:FacedImageAcquisitionProfileCode	Namespace	2	N1	
			Contents	6	Y	added values 32, 42, 52
10.022	ansi-nist:FacedImageAttribute	biom:FacedImageAttribute	Namespace	2	N1	
			Deprecation Status	6	Y	
"	ansi-nist:FacedImageAttributeCode	biom:FacedImageAttributeCode	Namespace	2	N1	
			Deprecation Status	6	Y	
"	ansi-nist:FacedImageAttributeText	biom:FacedImageAttributeText	Namespace	2	N1	
			Deprecation Status	6	Y	
10.026	ansi-nist:FacedImageDescriptionCode	biom:FacedImageDescriptionCode	Namespace	2	N1	
			Contents	8	Y2	fixed code value RAISED EYEBROWS -> RAISED BROWS to match spec
			Contents	8	Y	added enumeration values for physical characteristics (missing from 2008 schema).
"		biom:FacedImageDescriptionText	New element	8	Y	added to mapping to allow user-defined values (element existed in schema but was not mentioned by the 2008 spec).

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
10.027	ansi-nist:FacelImageEyeColorAttributeCode	biom:FacelImageEyeColorAttributeCode	Namespace	2	N1	
10.029	ansi-nist:FacelImageFeaturePoint	biom:FacelImageFeaturePoint	Namespace	2	N1	
"	ansi-nist:FeaturePointHorizontalCoordinateValue	biom:FeaturePointHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:FeaturePointIdentification	biom:FeaturePointIdentification	Namespace	2	N1	
"	ansi-nist:FeaturePointCategoryCode	biom:FeaturePointCategoryCode	Namespace	2	N1	
			Contents	6	Y	added value 2
"	ansi-nist:FeaturePointVerticalCoordinateValue	biom:FeaturePointVerticalCoordinateValue	Namespace	2	N1	
10.028	ansi-nist:FacelImageHairColorAttributeCode	biom:FacelImageHairColorAttributeCode	Namespace	2	N1	
			Contents	6	Y	added value STR
10.021	ansi-nist:FacelImagePoseOffsetAngleMeasure	biom:FacelImagePoseOffsetAngleMeasure	Namespace	2	N1	
10.020	ansi-nist:FacelImageSubjectPoseCode	biom:FacelImageSubjectPoseCode	Namespace	2	N1	
10.023	itl:FacelImageAcquisitionSource	biom:FacelImageAcquisitionSource (or deprecated substitute itl:FacelImageAcquisitionSource)	Namespace	4	N1	
"	ansi-nist:CaptureSourceCode	biom:CaptureSourceCode	Namespace	2	N1	
			Contents	8	Y2	eliminated value UNKNOWN
			Contents	6	N	changed ANALOGUE VIDEO to ANALOG VIDEO
			Contents	6	Y	added value TYPE20
"	itl:CaptureSourceDescriptionText	biom:CaptureSourceDescriptionText (or deprecated substitute itl:CaptureSourceDescriptionText)	Namespace	4	N1	
-	ansi-nist:PhysicalFeatureDescriptionDetail	biom:PhysicalFeatureDescriptionDetail	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 9
10.043	ansi-nist:PhysicalFeatureColorDetail	biom:PhysicalFeatureColorDetail	Namespace	2	N1	
"	ansi-nist:PhysicalFeaturePrimaryColorCode	biom:PhysicalFeaturePrimaryColorCode	Namespace	2	N1	
"	ansi-nist:PhysicalFeatureSecondaryColorCode	biom:PhysicalFeatureSecondaryColorCode	Namespace	2	N1	
			Cardinality	6	N	max occurrences constrained to 5
10.042	ansi-nist:PhysicalFeatureCategoryCode	biom:PhysicalFeatureCategoryCode	Namespace	2	N1	
			Contents	6	Y	added value PIERCING
"	ansi-nist:PhysicalFeatureClassCode	biom:PhysicalFeatureClassCode	Namespace	2	N1	
			Cardinality	8	Y	min occurrences loosened to 0
"	ansi-nist:PhysicalFeatureDescriptionText	biom:PhysicalFeatureDescriptionText	Namespace	2	N1	
"	ansi-nist:PhysicalFeatureSubClassCode	biom:PhysicalFeatureSubClassCode	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
			Cardinality	8	Y	min occurrences loosened to 0
			Contents	8	Y2	fixed HEADBND to HEDBND to match the standard
10.040	ansi-nist:PhysicalFeatureNCICCode	biom:PhysicalFeatureNCICCode	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 3
			Cardinality	6	Y	min occurrences loosened to 0
10.041	ansi-nist:PhysicalFeatureSize	biom:PhysicalFeatureSize	Namespace	2	N1	
"	ansi-nist:PhysicalFeatureHeightMeasure	biom:PhysicalFeatureHeightMeasure	Namespace	2	N1	
"	ansi-nist:PhysicalFeatureWidthMeasure	biom:PhysicalFeatureWidthMeasure	Namespace	2	N1	
10.014, 10.015, 10.018, 10.019, 10.031 - 10.039, 10.044 - 10.998			New elements	6	Y	<i>New elements; see specification for details</i>
Type 13	itl:PackageLatentImageRecord	itl:PackageLatentImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow two image types: biom:FingerImpressionImage and biom:PalmpointImage (and deprecated substitutes)
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
13.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
13.200 - 13.900	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	
			Cardinality	8	Y	max occurrences loosened to *
-	itl:FingerprintImage	biom:FingerImpressionImage (or deprecated substitute itl:FingerprintImage)	Namespace	4	N1	
			Name	4, 5	N	Name changed to correctly distinguish it from Type 4 fingerprint images.
-	itl:PalmpointImage	biom:PalmpointImage (or deprecated	Namespace	4	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
		substitute itl:PalmpointImage)				
-		biom:PlantarImage	New element	6	Y	
-		biom:FrictionRidgeImage	New element	6	Y	
13.999	nc:BinaryBase64Object	nc:BinaryBase64Object	no change			
13.012	ansi-nist:ImageBitsPerPixelQuantity	biom:ImageBitsPerPixelQuantity	Namespace	2	N1	
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
13.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
13.016	ansi-nist:CaptureHorizontalPixelDensityValue	biom:CaptureHorizontalPixelDensityValue	Namespace	2	N1	
13.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	
13.017	ansi-nist:CaptureVerticalPixelDensityValue	biom:CaptureVerticalPixelDensityValue	Namespace	2	N1	
13.020	ansi-nist:ImageCommentText	biom:ImageCommentText	Namespace	2	N1	
13.011	ansi-nist:ImageCompressionAlgorithmText	biom:ImageCompressionAlgorithmText	Namespace	2	N1	
13.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
13.009	ansi-nist:ImageHorizontalPixelDensityValue	biom:ImageHorizontalPixelDensityValue	Namespace	2	N1	
13.008	ansi-nist:ImageScaleUnitsCode	biom:ImageScaleUnitsCode	Namespace	2	N1	
13.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
13.010	ansi-nist:ImageVerticalPixelDensityValue	biom:ImageVerticalPixelDensityValue	Namespace	2	N1	
13.003	ansi-nist:FingerprintImageImpressionCaptureCategoryCode	biom:FingerprintImageImpressionCaptureCategoryCode	Namespace	2	N1	
			Contents	6	Y	added values 30 through 39
13.013	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17, 40 through 50
			Cardinality	8	Y2	max occurrences constrained to 6
"	ansi-nist:PalmPositionCode	biom:PalmPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 37, 38, 81, 82, 83, 84
			Cardinality	8	Y2	max occurrences constrained to 6
"		biom:PlantarPositionCode	New element	6	Y	
"		biom:FrictionRidgePositionCode	New element	6	Y	
-	ansi-nist:FingerprintImageMajorCasePrint	biom:FingerprintImageMajorCasePrint	Namespace	2	N1	
13.014	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
			Cardinality	8	Y2	max occurrences constrained to 9
"	ansi-nist:MajorCasePrintCode	biom:MajorCasePrintCode	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 9
13.015	ansi-nist:MajorCasePrintSegmentOffset	biom:MajorCasePrintSegmentOffset	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 12
"	ansi-nist:SegmentBottomVerticalCoordinateValue	biom:SegmentBottomVerticalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentLocationCode	biom:SegmentLocationCode	Namespace	2	N1	
			Contents	7	Y2	restricted values to those allowed by the spec: NA, PRX, DST, MED
"	ansi-nist:SegmentFingerViewCode	biom:SegmentFingerViewCode				
			Namespace	2	N1	
			Contents	8	Y2	removed erroneous value FV0
"	ansi-nist:SegmentLeftHorizontalCoordinateValue	biom:SegmentLeftHorizontalCoordinateValue	Contents	6	Y	added values EJI, TIP, NA
			Namespace	2	N1	
"	ansi-nist:SegmentRightHorizontalCoordinateValue	biom:SegmentRightHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentTopVerticalCoordinateValue	biom:SegmentTopVerticalCoordinateValue	Namespace	2	N1	
13.024	itl:FingerprintImageQuality	biom:FingerprintImageQuality (or deprecated substitute itl:FingerprintImageQuality)	Namespace	4	N1	
13.024	itl:PalmpointImageQuality	biom:PalmpointImageQuality (or deprecated substitute itl:PalmpointImageQuality)	Namespace	4	N1	
"		biom:PlantarImageQuality	New element	6	Y	
"		biom:FrictionRidgeImageQuality	New element	6	Y	
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17, 40 through 50
			Cardinality	8	Y2	min occurrences constrained to 1
"	ansi-nist:PalmPositionCode	biom:PalmPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 37, 38, 81, 82, 83, 84
			Cardinality	8	Y2	min occurrences constrained to 1
"		biom:PlantarPositionCode	New	6	Y	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
			element			
"		biom:FrictionRidgePositionCode	New element	6	Y	
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmVendorIdentification	biom:QualityAlgorithmVendorIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
13.902 - 13.998			New elements	6	Y	<i>New elements; see specification for details</i>
Type 14	itl:PackageFingerprintImageRecord	itl:PackageFingerprintImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:FingerImpressionImage (and deprecated substitute)
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
14.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
14.200 - 14.900	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	
			Cardinality	8	Y	max occurrences loosened to *
-	itl:FingerprintImage	biom:FingerImpressionImage (or deprecated substitute itl:FingerprintImage)	Namespace	4	N1	
			Name	4, 5	N	Name changed to correctly distinguish it from Type 4 fingerprint images.
14.999	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
14.012	ansi-nist:ImageBitsPerPixelQuantity	biom:ImageBitsPerPixelQuantity	Namespace	2	N1	
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
14.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
14.016	ansi-nist:CaptureHorizontalPixelDensityValue	biom:CaptureHorizontalPixelDensityValue	Namespace	2	N1	
14.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	
14.017	ansi-nist:CaptureVerticalPixelDensityValue	biom:CaptureVerticalPixelDensityValue	Namespace	2	N1	
14.030	ansi-nist:CaptureDeviceMonitoringModeCode	biom:CaptureDeviceMonitoringModeCode	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
14.020	ansi-nist:ImageCommentText	biom:ImageCommentText	Namespace	2	N1	
14.011	ansi-nist:ImageCompressionAlgorithmText	biom:ImageCompressionAlgorithmText	Namespace	2	N1	
14.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
14.009	ansi-nist:ImageHorizontalPixelDensityValue	biom:ImageHorizontalPixelDensityValue	Namespace	2	N1	
14.008	ansi-nist:ImageScaleUnitsCode	biom:ImageScaleUnitsCode	Namespace	2	N1	
14.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
14.010	ansi-nist:ImageVerticalPixelDensityValue	biom:ImageVerticalPixelDensityValue	Namespace	2	N1	
14.003	ansi-nist:FingerprintImageImpressionCaptureCategoryCode	biom:FingerprintImageImpressionCaptureCategoryCode	Namespace	2	N1	
14.013	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17, 33, 36, 40 through 50
-	ansi-nist:FingerprintImageMajorCasePrint	biom:FingerprintImageMajorCasePrint	Namespace	2	N1	
14.014	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 9
"	ansi-nist:MajorCasePrintCode	biom:MajorCasePrintCode	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 9
14.015	ansi-nist:MajorCasePrintSegmentOffset	biom:MajorCasePrintSegmentOffset	Namespace	2	N1	
			Cardinality	8	Y2	max occurrences constrained to 12
"	ansi-nist:SegmentBottomVerticalCoordinateValue	biom:SegmentBottomVerticalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentLocationCode	biom:SegmentLocationCode	Namespace	2	N1	
			Contents	7	Y2	restricted values to those allowed by the spec: NA, PRX, DST, MED
"	ansi-nist:SegmentFingerViewCode	biom:SegmentFingerViewCode	Namespace	2	N1	
			Contents	8	Y2	removed erroneous value FV0
			Contents	6	Y	added values TIP, NA
"	ansi-nist:SegmentLeftHorizontalCoordinateValue	biom:SegmentLeftHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentRightHorizontalCoordinateValue	biom:SegmentRightHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentTopVerticalCoordinateValue	biom:SegmentTopVerticalCoordinateValue	Namespace	2	N1	
14.018	itl:FingerprintImageFingerMissing	biom:FingerprintImageFingerMissing (or	Namespace	4	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
		deprecated substitute itl:FingerprintImageFingerMissing)				
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17
"	itl:FingerMissingCode	biom:FingerMissingCode (or deprecated substitute itl:FingerMissingCode)	Namespace	4	N1	
			Contents	5, 7	Y2	constrained to use the code values
14.021	itl:FingerprintImageSegmentPositionSquare	biom:FingerprintImageSegmentPositionSquare (or deprecated substitute itl:FingerprintImageSegmentPositionSquare)	Namespace	4	N1	
			Cardinality	6	N	occurrences constrained to 0..5
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17, 40 through 50
"	ansi-nist:SegmentLeftHorizontalCoordinateValue	biom:SegmentLeftHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentRightHorizontalCoordinateValue	biom:SegmentRightHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentTopVerticalCoordinateValue	biom:SegmentTopVerticalCoordinateValue	Namespace	2	N1	
"	ansi-nist:SegmentBottomVerticalCoordinateValue	biom:SegmentBottomVerticalCoordinateValue	Namespace	2	N1	
14.022	ansi-nist:FingerprintImageNISTQuality	biom:FingerprintImageNISTQuality	Namespace	2	N1	
			Cardinality	6	Y	occurrences loosened to 0..5
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17
			Cardinality	7	Y2	occurrences constrained to 1..1
"	ansi-nist:NISTQualityMeasure	biom:NISTQualityMeasure	Namespace	2	N1	
14.023	ansi-nist:FingerprintImageSegmentationQuality	biom:FingerprintImageSegmentationQuality	Namespace	2	N1	
			Cardinality	6	N	occurrences constrained to 0..5
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17
			Cardinality	7	Y2	occurrences constrained to 1..1
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmVendorIdentification	biom:QualityAlgorithmVendorIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
14.024	itl:FingerprintImageQuality	biom:FingerprintImageQuality (or	Namespace	4	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
		deprecated substitute itl:FingerprintImageQuality)	Cardinality	6	N	occurrences constrained to 0..5
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17
			Cardinality	7	Y2	occurrences constrained to 1..1
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmVendorIdentification	biom:QualityAlgorithmVendorIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
14.025	itl:FingerprintImageSegmentPositionPolygon	biom:FingerprintImageSegmentPositionPolygon (or deprecated substitute itl:FingerprintImageSegmentPositionPolygon)	Namespace	4	N1	
			Cardinality	6	Y	occurrences loosened to 0..5
"	ansi-nist:FingerPositionCode	biom:FingerPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 16, 17
			Cardinality	7	Y2	occurrences constrained to 1..1
"	itl:PositionPolygonVertexQuantity	biom:PositionPolygonVertexQuantity (or deprecated substitute itl:PositionPolygonVertexQuantity)	Namespace	4	N1	
"	itl:PositionPolygonVertex	biom:PositionPolygonVertex (or deprecated substitute itl:PositionPolygonVertex)	Namespace	4	N1	
"	ansi-nist:PositionHorizontalCoordinateValue	biom:PositionHorizontalCoordinateValue	Namespace	2	N1	
"	ansi-nist:PositionVerticalCoordinateValue	biom:PositionVerticalCoordinateValue	Namespace	2	N1	
14.026 - 14.027, 14.031 - 14.998			New elements	6	Y	<i>New elements; see specification for details</i>
Type 15	itl:PackagePalmprintImageRecord	itl:PackagePalmprintImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:PalmprintImage (and deprecated substitute)

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	constrained to the list of record type codes
			Contents	5, 7	Y2	
15.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
15.200 - 15.900	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	max occurrences loosened to *
			Cardinality	8	Y	
-	itl:PalmpointImage	biom:PalmpointImage (or deprecated substitute itl:PalmpointImage)	Namespace	4	N1	
15.999	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
15.012	ansi-nist:ImageBitsPerPixelQuantity	biom:ImageBitsPerPixelQuantity	Namespace	2	N1	
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
15.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
15.016	ansi-nist:CaptureHorizontalPixelDensityValue	biom:CaptureHorizontalPixelDensityValue	Namespace	2	N1	
15.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	
15.017	ansi-nist:CaptureVerticalPixelDensityValue	biom:CaptureVerticalPixelDensityValue	Namespace	2	N1	
15.030	ansi-nist:CaptureDeviceMonitoringModeCode	biom:CaptureDeviceMonitoringModeCode	Namespace	2	N1	
15.020	ansi-nist:ImageCommentText	biom:ImageCommentText	Namespace	2	N1	
15.011	ansi-nist:ImageCompressionAlgorithmText	biom:ImageCompressionAlgorithmText	Namespace	2	N1	
15.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
15.009	ansi-nist:ImageHorizontalPixelDensityValue	biom:ImageHorizontalPixelDensityValue	Namespace	2	N1	
15.008	ansi-nist:ImageScaleUnitsCode	biom:ImageScaleUnitsCode	Namespace	2	N1	
15.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
15.010	ansi-nist:ImageVerticalPixelDensityValue	biom:ImageVerticalPixelDensityValue	Namespace	2	N1	
15.003	ansi-nist:FingerprintImageImpressionCaptureCategoryCode	biom:FingerprintImageImpressionCaptureCategoryCode	Namespace	2	N1	
15.013	ansi-nist:PalmPositionCode	biom:PalmPositionCode	Namespace	2	N1	added values 37, 38, 81, 82, 83, 84
			Contents	6	Y	
15.024	itl:PalmpointImageQuality	biom:PalmpointImageQuality (or deprecated substitute itl:PalmpointImageQuality)	Namespace	4	N1	Occurrences changed to 0..9 (2007 specification said 0..4, 2008 schema erroneously allowed 0..*)
			Cardinality	6	Y2	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
"	ansi-nist:PalmPositionCode	biom:PalmPositionCode	Namespace	2	N1	
			Contents	6	Y	added values 37, 38, 81, 82, 83, 84
			Cardinality	6	Y2	Occurrences changed to 1..1 (2007 specification said 1..1, 2008 schema erroneously allowed 0..*)
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmVendorIdentification	biom:QualityAlgorithmVendorIdentification	Namespace	2	N1	
15.018, 15.902 - 15.998			New elements	6	Y	<i>New elements; see specification for details</i>
Type 16	itl:PackageUserDefinedTestingImageRecord	itl:PackageUserDefinedTestingImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:TestImage (and deprecated substitute)
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
16.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
16.200 - 16.900	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	
			Cardinality	8	Y	max occurrences loosened to *
-	itl:TestImage	biom:TestImage (or deprecated substitute itl:TestImage)	Namespace	4	N1	
16.999	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
16.003	nc:BinaryDescriptionText	nc:BinaryDescriptionText	<i>no change</i>		Y	
16.012	ansi-nist:ImageBitsPerPixelQuantity	biom:ImageBitsPerPixelQuantity	Namespace	2	N1	
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
16.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
16.016	ansi-nist:CaptureHorizontalPixelDensityValue	biom:CaptureHorizontalPixelDensityValue	Namespace	2	N1	
16.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	
16.017	ansi-nist:CaptureVerticalPixelDensityValue	biom:CaptureVerticalPixelDensityValue	Namespace	2	N1	
16.030	ansi-nist:CaptureDeviceMonitoringModeCode	biom:CaptureDeviceMonitoringModeCode	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
		e				
16.013	ansi-nist:ImageColorSpaceCode	biom:ImageColorSpaceCode	Namespace	2	N1	
16.020	ansi-nist:ImageCommentText	biom:ImageCommentText	Namespace	2	N1	
16.011	ansi-nist:ImageCompressionAlgorithmText	biom:ImageCompressionAlgorithmText	Namespace	2	N1	
16.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
16.009	ansi-nist:ImageHorizontalPixelDensityValue	biom:ImageHorizontalPixelDensityValue	Namespace	2	N1	
16.024	ansi-nist:ImageQuality	biom:ImageQuality	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
"	ansi-nist:QualityMeasureVendorIdentification	biom:QualityAlgorithmVendorIdentification (or deprecated substitute biom:QualityMeasureVendorIdentification)	Namespace Name	2 5	N1 N	reuse - there were two elements with the same meaning
16.008	ansi-nist:ImageScaleUnitsCode	biom:ImageScaleUnitsCode	Namespace	2	N1	
16.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
16.010	ansi-nist:ImageVerticalPixelDensityValue	biom:ImageVerticalPixelDensityValue	Namespace	2	N1	
16.902 - 16.998			New elements	6	Y	<i>New elements; see specification for details</i>
Type 17	itl:PackageIrisImageRecord	itl:PackageIrisImageRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:IrisImage (and deprecated substitute)
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
17.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
17.200 - 17.900	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	
			Cardinality	8	Y	max occurrences loosened to *
-	itl:IrisImage	biom:IrisImage (or deprecated substitute itl:IrisImage)	Namespace	4	N1	
17.999	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
17.012	ansi-nist:ImageBitsPerPixelQuantity	biom:ImageBitsPerPixelQuantity	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
17.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
17.018	ansi-nist:CaptureDeviceGlobalIdentification	--				
			Deleted	6	N	"Deprecation" in the ITL standard means that it cannot appear in this version, so it was deleted.
17.017	ansi-nist:CaptureDeviceIdentification	biom:CaptureDeviceIdentification	Namespace	2	N1	
			Location	5	N	moved from IrisImageCapture to ImageCaptureDetail - was previously allowed in two places
17.019	ansi-nist:CaptureDeviceMakeText	biom:CaptureDeviceMakeText	Namespace	2	N1	
			Location	5	N	moved from IrisImageCapture to ImageCaptureDetail - was previously allowed in two places
17.019	ansi-nist:CaptureDeviceModelText	biom:CaptureDeviceModelText	Namespace	2	N1	
			Location	5	N	moved from IrisImageCapture to ImageCaptureDetail - was previously allowed in two places
17.019	ansi-nist:CaptureDeviceSerialNumberText	biom:CaptureDeviceSerialNumberText	Namespace	2	N1	
			Location	5	N	moved from IrisImageCapture to ImageCaptureDetail - was previously allowed in two places
17.022	ansi-nist:CaptureHorizontalPixelDensityValue	biom:CaptureHorizontalPixelDensityValue	Namespace	2	N1	
17.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	
17.023	ansi-nist:CaptureVerticalPixelDensityValue	biom:CaptureVerticalPixelDensityValue	Namespace	2	N1	
17.030	ansi-nist:CaptureDeviceMonitoringModeCode	biom:CaptureDeviceMonitoringModeCode	Namespace	2	N1	
17.013	ansi-nist:ImageColorSpaceCode	biom:ImageColorSpaceCode	Namespace	2	N1	
17.021	ansi-nist:ImageCommentText	biom:ImageCommentText	Namespace	2	N1	
17.011	ansi-nist:ImageCompressionAlgorithmText	biom:ImageCompressionAlgorithmText	Namespace	2	N1	
17.006	ansi-nist:ImageHorizontalLineLengthPixelQuantity	biom:ImageHorizontalLineLengthPixelQuantity	Namespace	2	N1	
17.009	ansi-nist:ImageHorizontalPixelDensityValue	biom:ImageHorizontalPixelDensityValue	Namespace	2	N1	
17.024	ansi-nist:ImageQuality	biom:ImageQuality	Namespace	2	N1	
"	ansi-	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
	nist:QualityAlgorithmProductIdentification	on				
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
"	ansi-nist:QualityMeasureVendorIdentification	biom:QualityAlgorithmVendorIdentification (or deprecated substitute biom:QualityMeasureVendorIdentification)	Namespace	2	N1	
			Name	5	N	reuse - there were two elements with the same meaning
17.008	ansi-nist:ImageScaleUnitsCode	biom:ImageScaleUnitsCode	Namespace	2	N1	
17.007	ansi-nist:ImageVerticalLineLengthPixelQuantity	biom:ImageVerticalLineLengthPixelQuantity	Namespace	2	N1	
17.010	ansi-nist:ImageVerticalPixelDensityValue	biom:ImageVerticalPixelDensityValue	Namespace	2	N1	
17.003	ansi-nist:IrisEyePositionCode	biom:IrisEyePositionCode	Namespace	2	N1	
17.014	ansi-nist:IrisEyeRotationAngleMeasure	biom:IrisEyeRotationAngleText	Namespace	2	N1	
			Name	8	N	Element needs to allow value FFFF as per 2007 specification, so representation term needs to change (Measure is for a numeric value).
17.015	ansi-nist:IrisEyeRotationUncertaintyValueText	biom:IrisEyeRotationUncertaintyValueText	Namespace	2	N1	
17.016	ansi-nist:IrisImageCapture	biom:IrisImageCapture	Namespace	2	N1	
			Cardinality	8	Y2	Occurrences changed to 0..1 (2007 specification said 0..1, 2008 schema erroneously allowed 0..*)
"	ansi-nist:IrisImageHorizontalOrientationCode	biom:IrisImageHorizontalOrientationCode	Namespace	2	N1	
"	ansi-nist:IrisImageScanCategoryCode	biom:IrisImageScanCategoryCode	Namespace	2	N1	
			Contents	6	N	removed values 2 and 3
"	ansi-nist:IrisImageVerticalOrientationCode	biom:IrisImageVerticalOrientationCode	Namespace	2	N1	
17.020	ansi-nist:IrisEyeColorAttributeCode	biom:IrisEyeColorAttributeCode	Namespace	2	N1	
		biom:IrisImageAcquisitionLightingSpectrum	New element	6	N	introduced to support multi-part value
17.025	ansi-nist:IrisImageAcquisitionLightingSpectrumValue	biom:AcquisitionLightingSpectrumCode	Namespace	2	N1	
			Name	5	N	name changed to reflect use of code list
			Contents	6	Y	added values RED, DEFINED, UNDEFINED

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
"		biom:AcquisitionLightingSpectrumLowerMeasure	New element	6	Y	
"		biom:AcquisitionLightingSpectrumUpperMeasure	New element	6	Y	
17.026	itl:IrisDiameterPixelQuantity	biom:IrisDiameterPixelQuantity (or deprecated substitute itl:IrisDiameterPixelQuantity)	Namespace	4	N1	
17.028, 17.031 - 17.998			New elements	6	Y	<i>New elements; see specification for details.</i>
Type 18		itl:PackageDNARecord	New elements	6	Y	<i>New record type; see specification for details</i>
Type 19		itl:PackagePlantarImageRecord	New elements	6	Y	<i>New record type; see specification for details</i>
Type 20		itl:PackageSourceRepresentationRecord	New elements	6	Y	<i>New record type; see specification for details</i>
Type 21		itl:PackageAssociatedContextRecord	New elements	6	Y	<i>New record type; see specification for details</i>
Type 98		itl:PackageInformationAssuranceRecord	New elements	6	Y	<i>New record type; see specification for details</i>
Type 99	itl:PackageCBEFFBiometricDataRecord	itl:PackageCBEFFBiometricDataRecord	Namespace	1	N1	
			Contents	7	Y2	constrained to only allow one image type: biom:CBEFFImage
-	ansi-nist:RecordCategoryCode	biom:RecordCategoryCode	Namespace	2	N1	
			Contents	5, 7	Y2	constrained to the list of record type codes
99.002	ansi-nist:ImageReferenceIdentification	biom:ImageReferenceIdentification	Namespace	2	N1	
99.200 - 99.900	itl:UserDefinedFields	itl:UserDefinedFields	Namespace	2	Y3	
			Cardinality	8	Y	max occurrences loosened to *
-	ansi-nist:CBEFFImage	biom:CBEFFImage	Namespace	2	N1	
99.999	nc:BinaryBase64Object	nc:BinaryBase64Object	<i>no change</i>			
-	ansi-nist:ImageCaptureDetail	biom:ImageCaptureDetail	Namespace	2	N1	
99.005	ansi-nist:CaptureDate	biom:CaptureDate	Namespace	2	N1	
99.004	ansi-nist:CaptureOrganization	biom:CaptureOrganization	Namespace	2	N1	

Field ID	Old element name	New element name	Type of change	Reason for change	Compatible?	Notes
99.102	ansi-nist:ImageQuality	biom:ImageQuality	Namespace	2	N1	
"	ansi-nist:QualityAlgorithmProductIdentification	biom:QualityAlgorithmProductIdentification	Namespace	2	N1	
"	ansi-nist:QualityValue	biom:QualityValue	Namespace	2	N1	
"	ansi-nist:QualityMeasureVendorIdentification	biom:QualityAlgorithmVendorIdentification (or deprecated substitute biom:QualityMeasureVendorIdentification)	Namespace	2	N1	
			Name	5	N	reuse - there were two elements with the same meaning
99.103	ansi-nist:CBEFFFormatOwnerIdentification	biom:CBEFFFormatOwnerIdentification	Namespace	2	N1	
99.104	ansi-nist:CBEFFFormatCategoryIdentification	biom:CBEFFFormatCategoryIdentification	Namespace	2	N1	
99.100	ansi-nist:CBEFFVersionIdentification	biom:CBEFFVersionIdentification	Namespace	2	N1	
99.101	ansi-nist:CBEFFCategoryCode	biom:CBEFFCategoryCode	Namespace	2	N1	
			Contents	6	N	removed values 2 (Facial features), 8 (Fingerprint), 10 (Iris), 4000 (DNA), 20000 (Palm print), 80000 (Foot print)
99.902 - 99.998			New elements	6	Y	<i>New elements; see specification for details</i>