Stronger and **Smarter**
Borders for the European Union
The Entry-Exit System

Smart Borders Pilot
German Experiences

IBPC 2016
NIST, Gaithersburg
05.05.2016

Federal Office of Administration

Federal Police

Bundesverwaltungsamt
Der zentrale Dienstleister des Bundes

Proposal: EU ENTRY / EXIT SYSTEM (EES)

How will the system work?

EES will collect:
Identity
Travel document
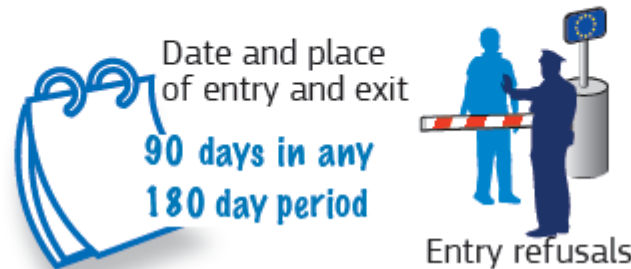
EES will record:
Date and place of entry and exit
90 days in any 180 day period
Entry refusals

EES will replace:
passport

To whom will it apply?

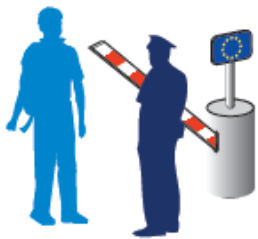to non-EU nationals, visa-required and visa-exempt travellers in the Schengen area.

Proposal: EU ENTRY / EXIT SYSTEM (EES)

Who is using EES data?
The **competent Member State authorities**
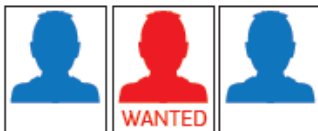
Border guards

Consular officers dealing with visas

Who will be able to access data in the EES?

Member States
Law enforcement authorities

Europol

will have access for criminal identification and criminal intelligence

WANTED

Border crossing facilitation
for all non-EU nationals

Traveller self-service kiosk

Border control lane

Border guard

Checks against security databases
(SIS, Interpol SLTD)

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Source: EU KOM , factsheet on EES, Brussels, 6.4.2016

Smart Borders Pilot in a nutshell

Scope	Air, sea and land borders crossing points (BCPs)
Member States	12 (DE, EE, EL, ES ,FI, FR, HU, IT, NL,PT, RO, SE)
Border crossing points	18
Test cases	78 test variations
TCN travellers	58.000
Border guards involved	About 350
Biometrics	Fingerprints (FP), facial image (FI) and iris
Process accelerators	ABC gates, kiosks
Desk research	Spoofing, VIS and travel document number, web service
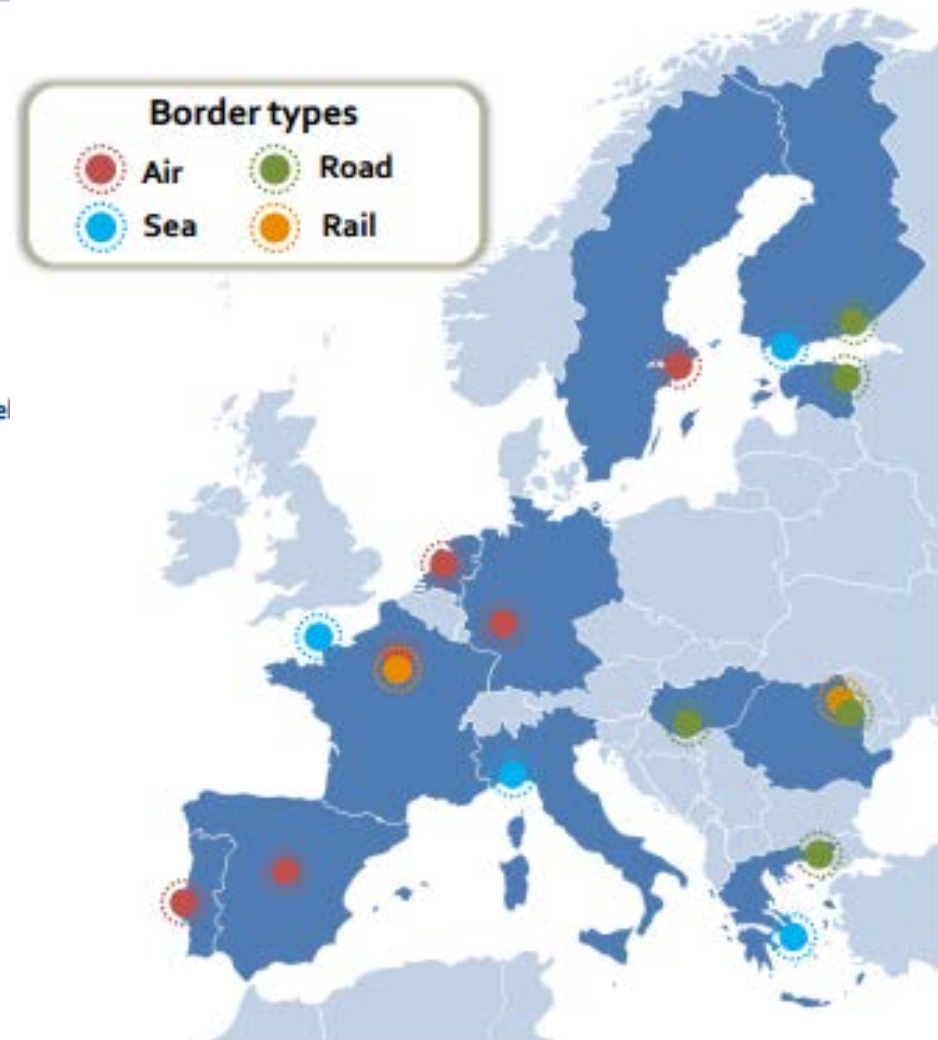
Focus on

- Technology state of play
- Which & "how many" biometrics?
- ABC & Self-Service Kiosks
- Operational & end user experiences

Border types
- Air
- Road
- Sea
- Rail

German Participation

EU Pilot

- Frankfurt Airport (FRA)
  - FP Enrolment (4 / 8 / 10 FP)
 - Automatic Border Control (ABC at Exit)

Extended National Pilot

- Additional Location: Seaport Warnemünde
- Additional Biometrics: Facial Image + Iris
- Additional Test Cases (many)
- **Unique within EU pilot:**
  - **End-2-End Pilot (with backends)**
  - **Full national integration**
  - Focus on **processes**

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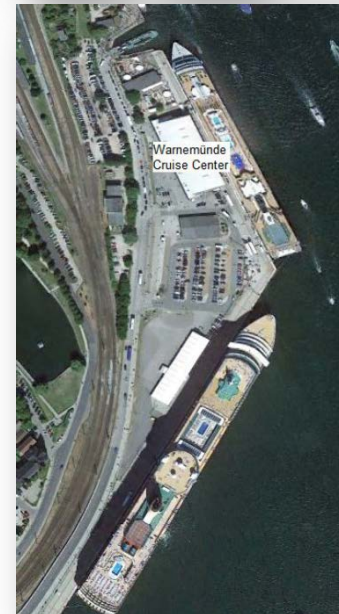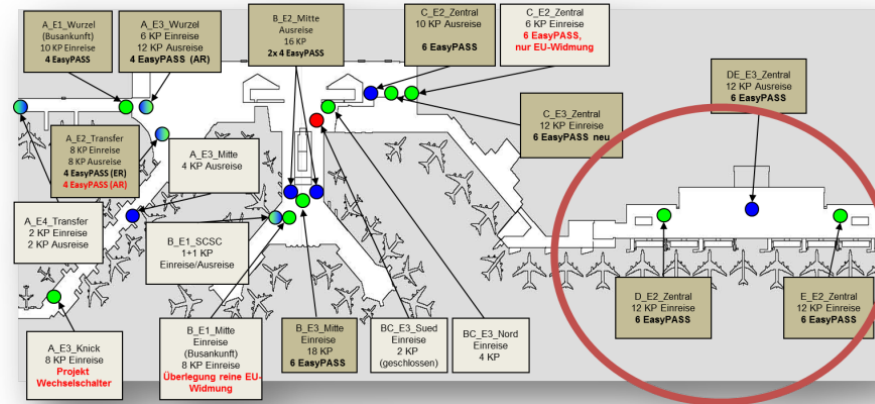
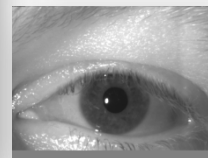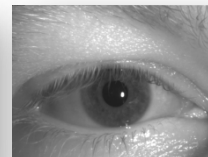# Smart Borders Pilot – National Integration
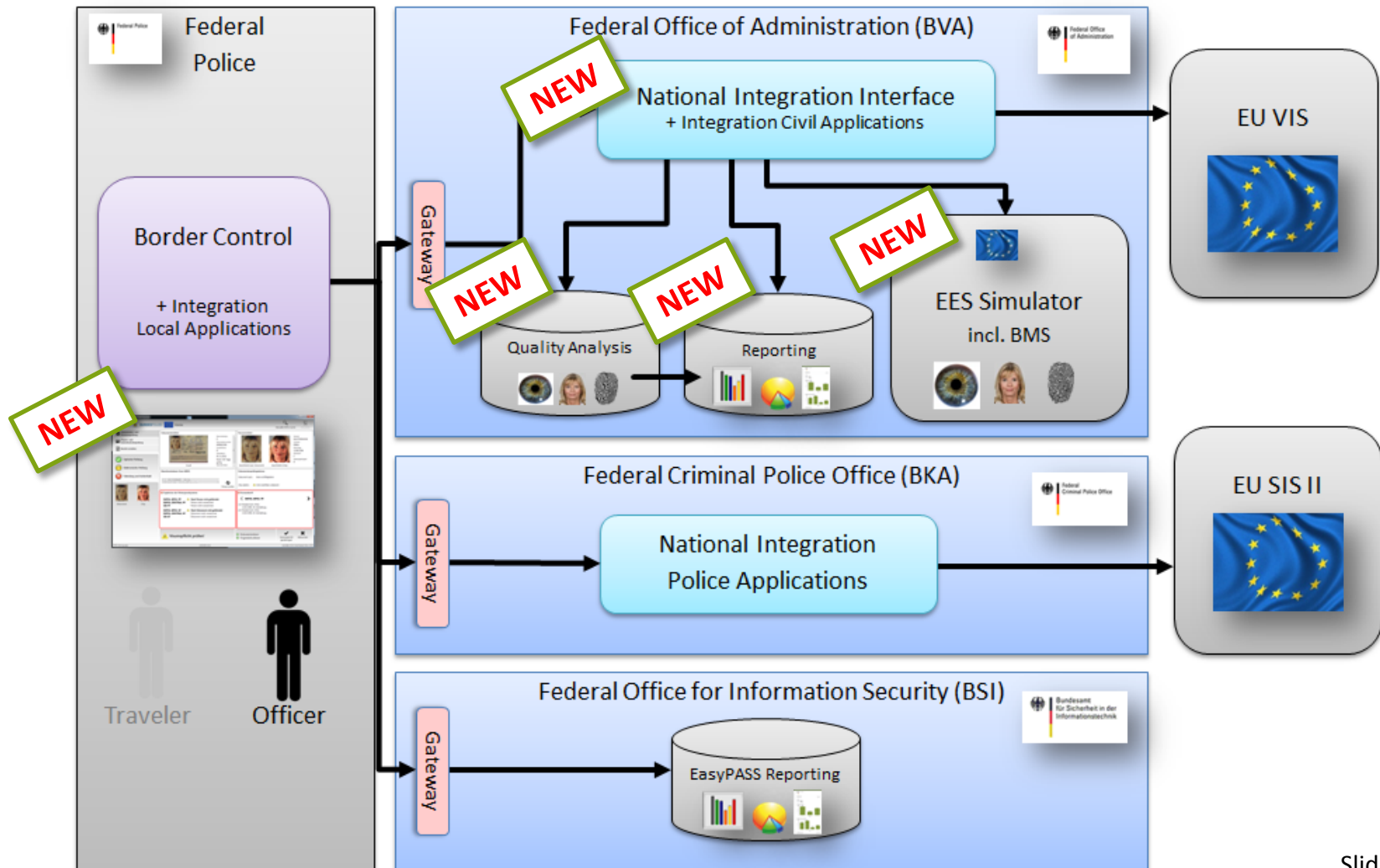
Equipment Enrolment

Morpho: „Fingerprint on the Fly" (FOTF)

Iris ID - iCAM TD100

Crossmatch: The „new" Guardian

Participating TCNs

ARE, ARG, AUS, AZE, CAN,

CHL, CHN, ISR, JPN, KAZ,

KOR, MDA, MKD, MYS,

NZL, QAT, RUS, SGP, SRB,

TGO, THA, TJK, TUR, TWN,

USA, VEN

Allowing TCNs to use ABCs during Exit

Video

(5 min)

- Lessons Learned on
  - Duration & Quality of data
  - Architecture & Organization
  - New Technologies & Biometrics

- Eu-LISA Pilot Report

- German Pilot Report
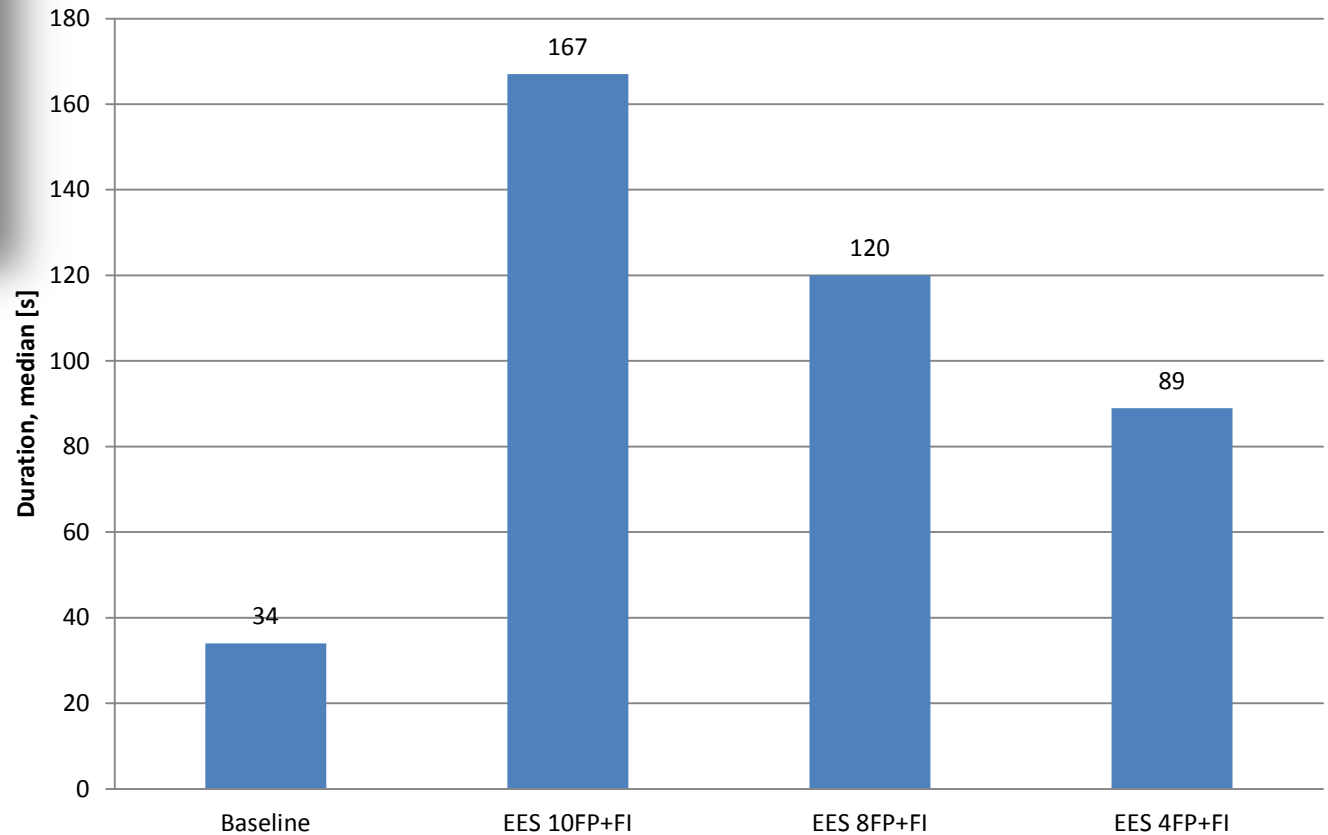 - In addition to eu-LISA report
  - in english

Duration

Duration First Entry for Visa Exempt

Duration of border control process for TCNVE, entry,
different biometrics, different devices, different quality thresholds.

Duration Distribution

EES TCNVE 8FP+FI

Legend:
- Other activities
- Capture FP for EES
- Capture photo
- Biometric identification
- Register Individual File
- EES retrieval
- Register Border Control
- Photo retrieval

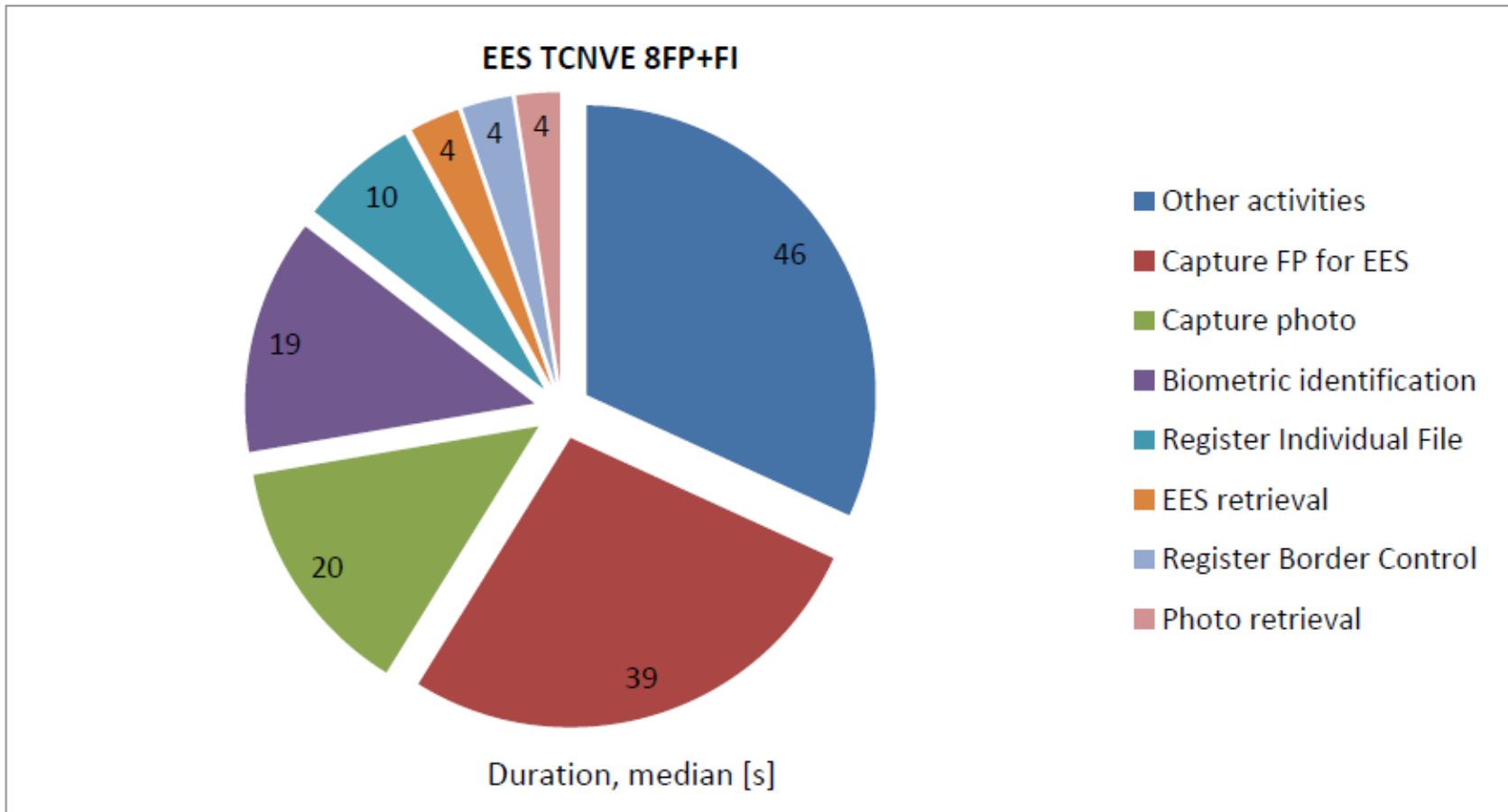Pie chart values: 46, 39, 20, 19, 10, 4, 4, 4
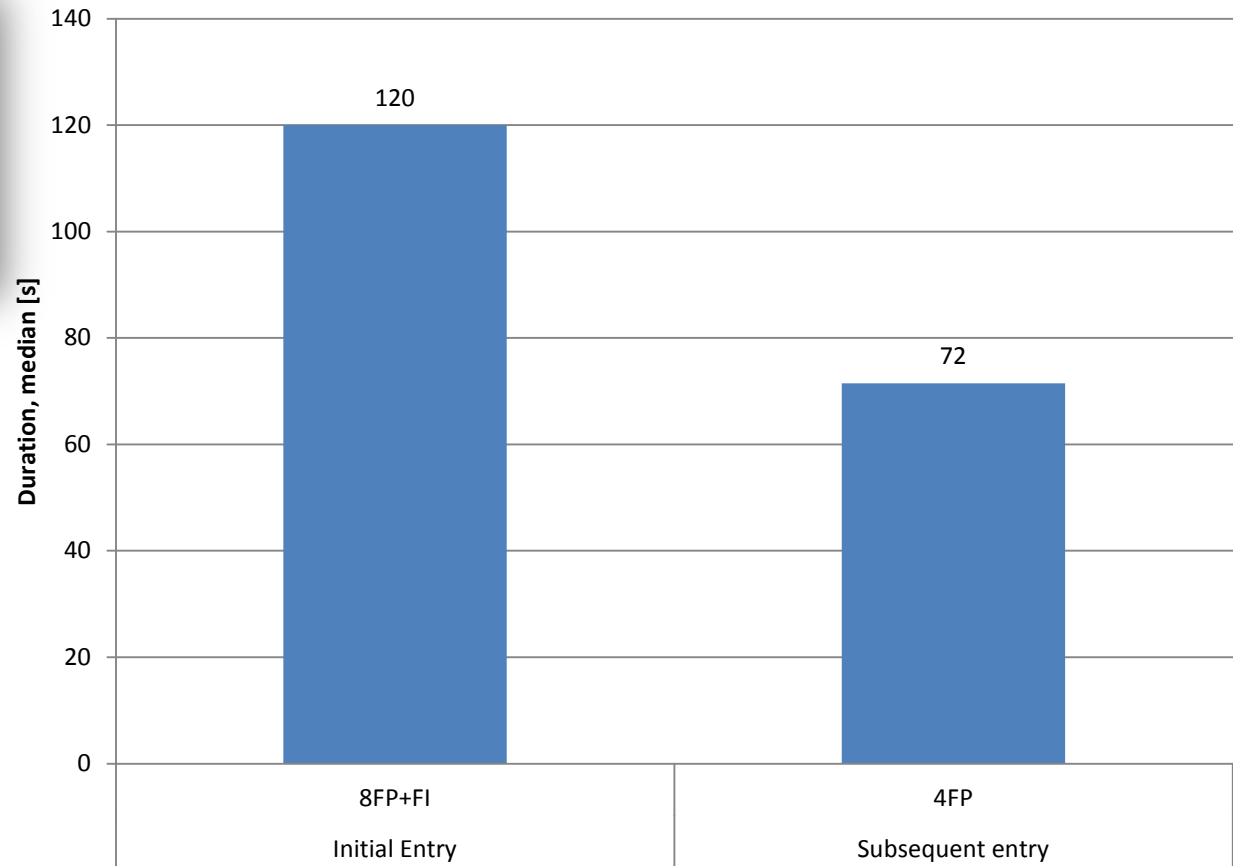
Duration, median [s]

Diagram 7: Duration of the single steps of the border control process for TCNVE, entry, capture of 8 fingerprints, eu-LISA final threshold
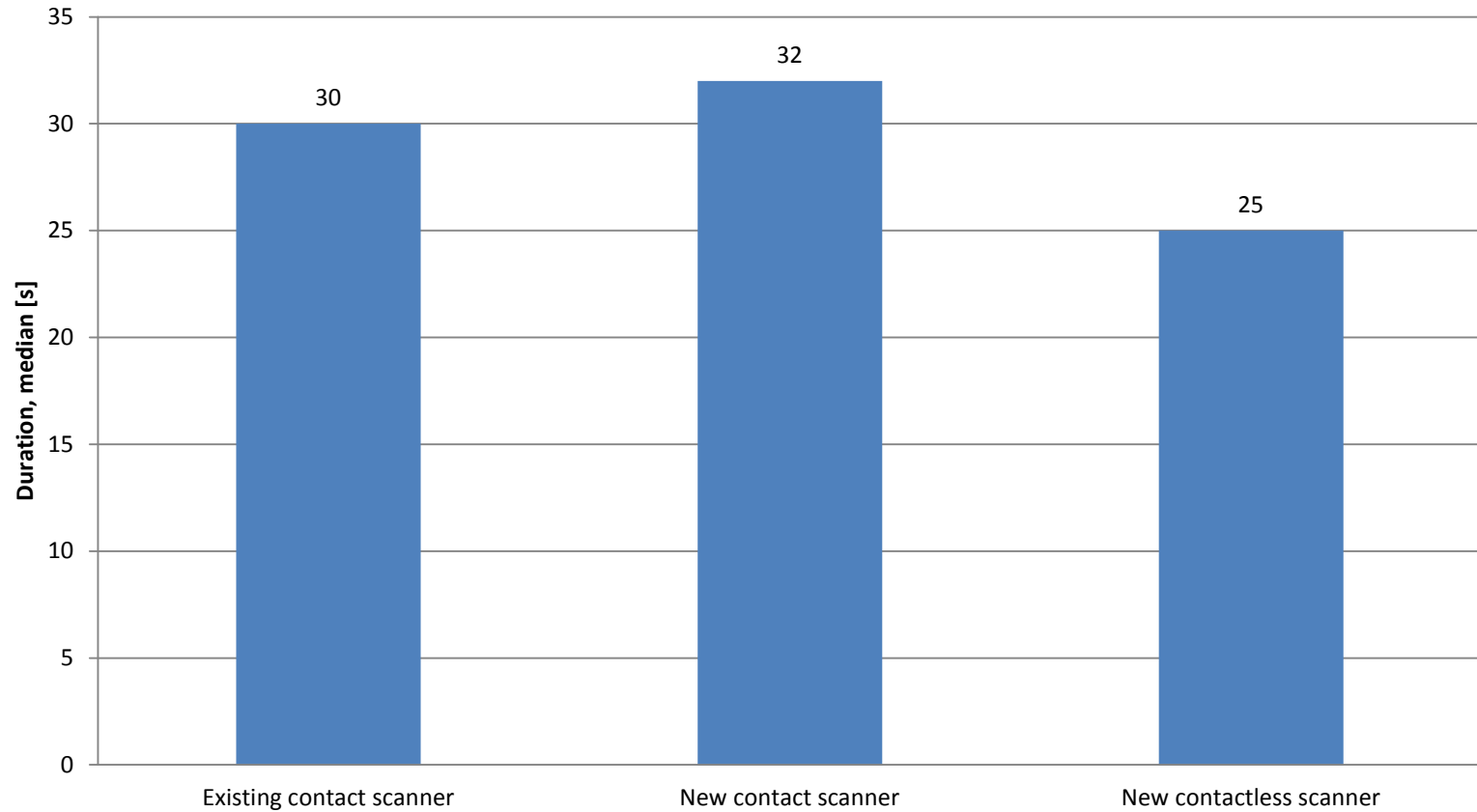
Duration: Example Subsequent Entry

Comparison of first and subsequent entries for visa-exempt travellers (TCNVE)

Duration: Distribution per Scanner

Duration of fingerprint capture process depending on scanner technology (TCNVE, entry, 8 fingers, eu-LISA final threshold)

Fingerprints
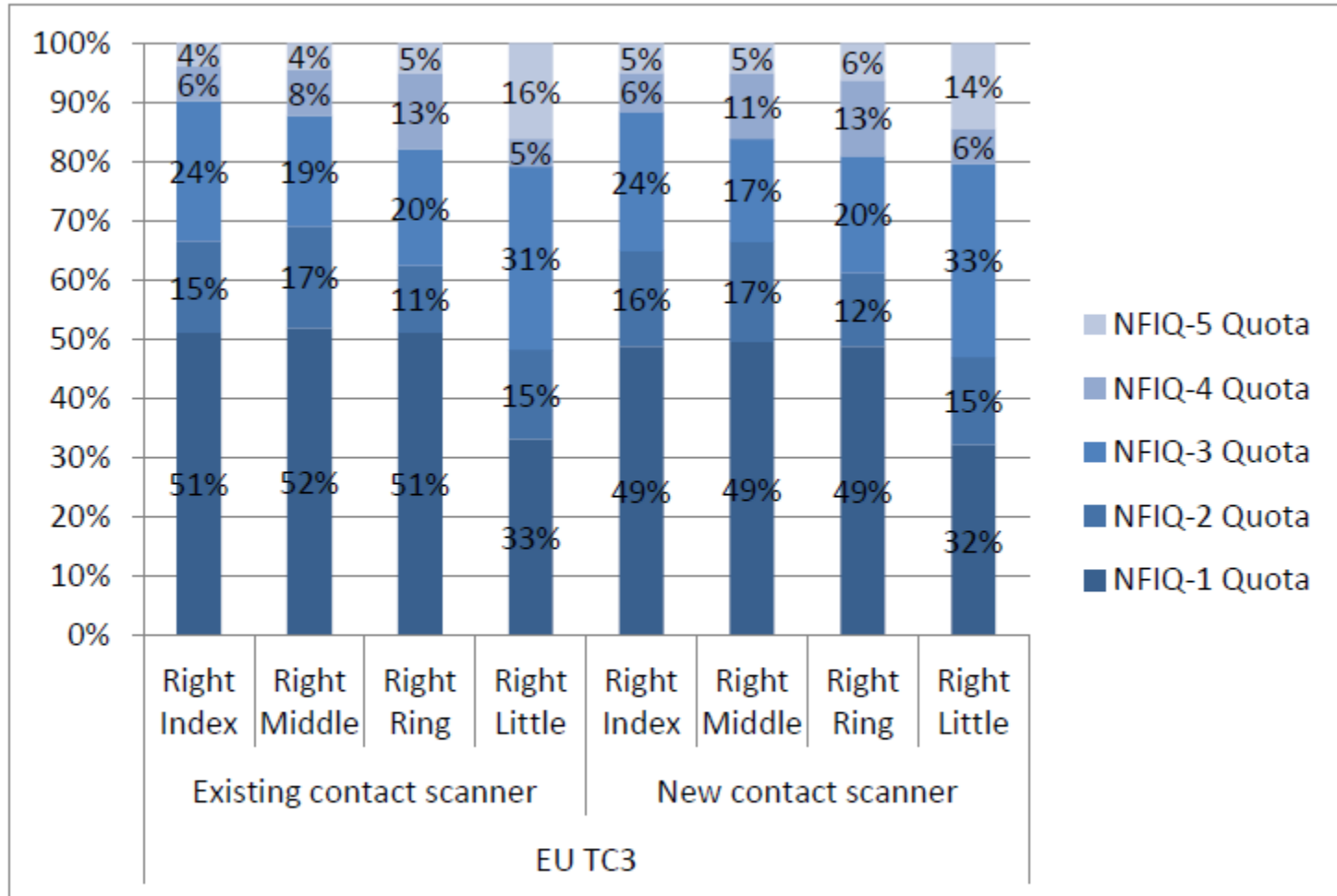
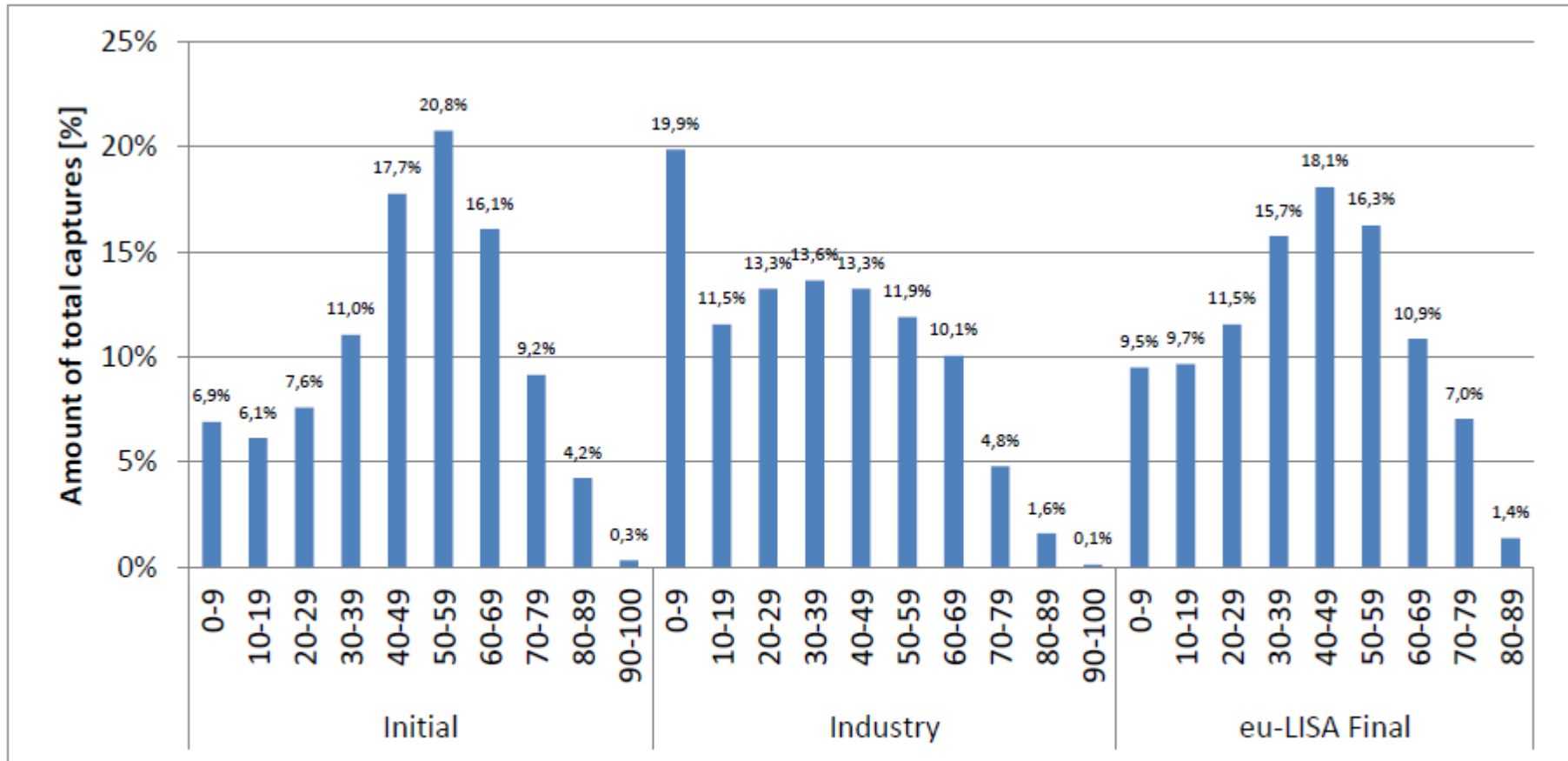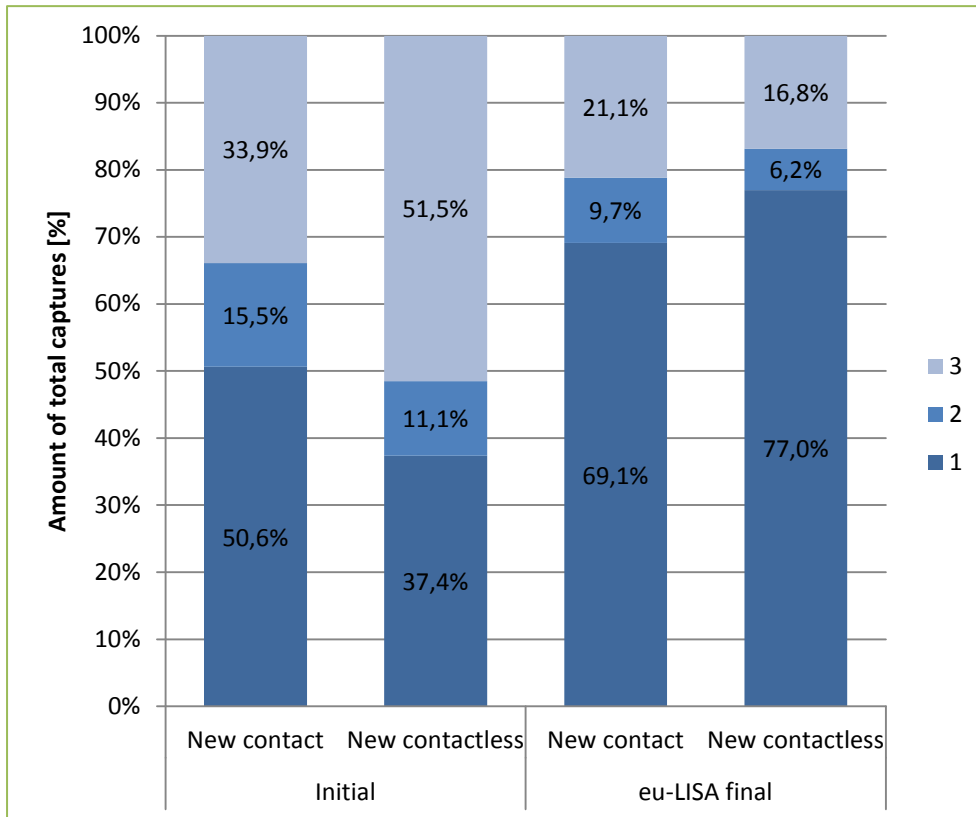Diagram 39: TC 3 - Distribution of NFIQ scores for fingers of right slap for each used scanner

Diagram 44: NFIQ 2 beta evaluation for captured fingers using the new contact scanner and different threshold configurations

Distribution of the capture count depending on scanner type & quality threshold

- Start with high quality threshold "Initial".
  BUT number of retries were too high

- ONLY used auto-capture by device for interim period.
  THAT was quick, but not comparable with rest of EU

- Compromise: "eu-LISA final"
  Reduced threshold
  Number of retries "feasible"

"Initial":   Retry policy on NFIQ 2/2/2/2/3/2/2/2/2/3
"eu-LISA Final": Retry policy on NFIQ 3/3/3/3/4/3/3/3/3/4

Slide 19

Quality: Time vs. Threshold

- Quality loss by reducing threshold is measurable BUT adequate

- Recommendation: accept lower quality and optimize time wise
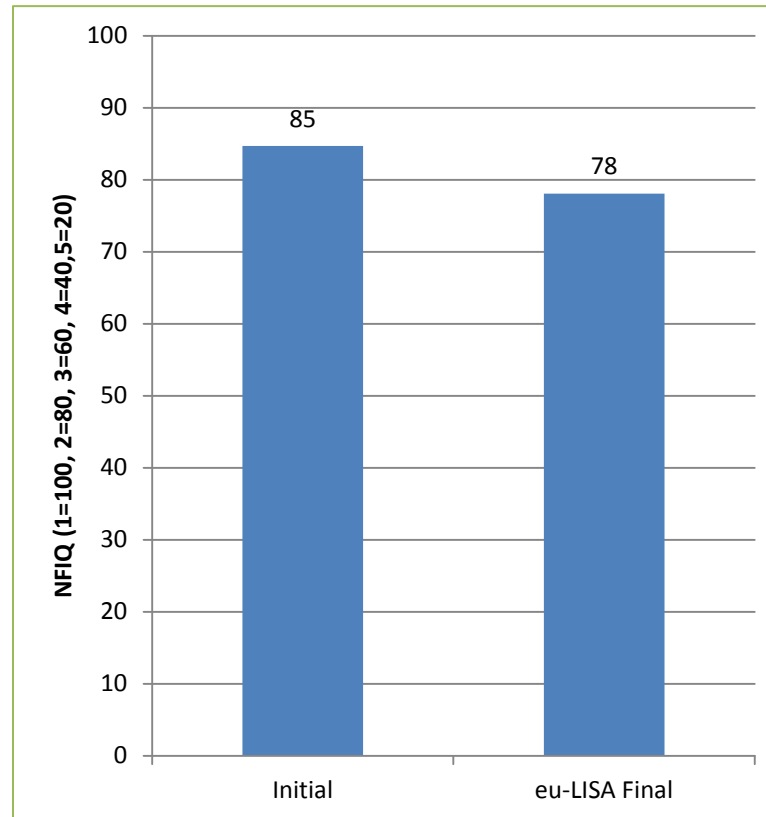
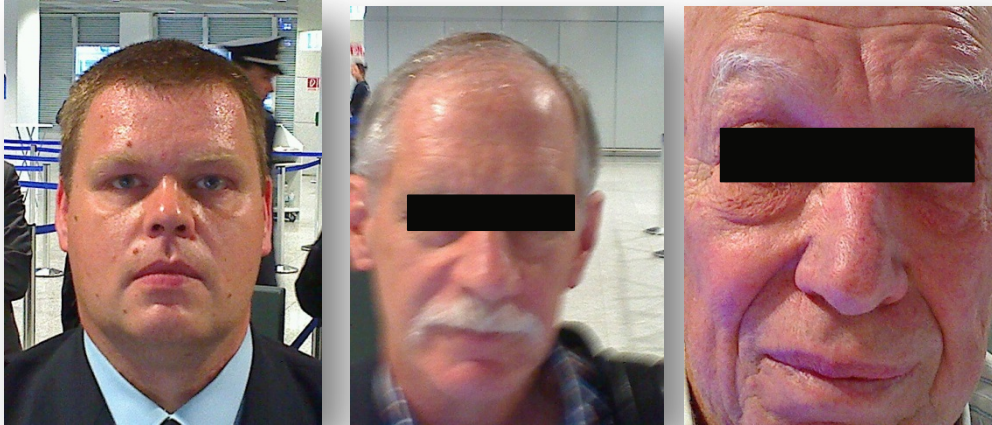*Distribution of fingerprint quality depending on quality thresholds*

"Initial":   Retry policy on NFIQ 2/2/2/2/3/2/2/2/2/3
"eu-LISA Final": Retry policy on NFIQ 3/3/3/3/4/3/3/3/3/4

Face & Iris

Live Capturing of Facial Image

- In general quality positive
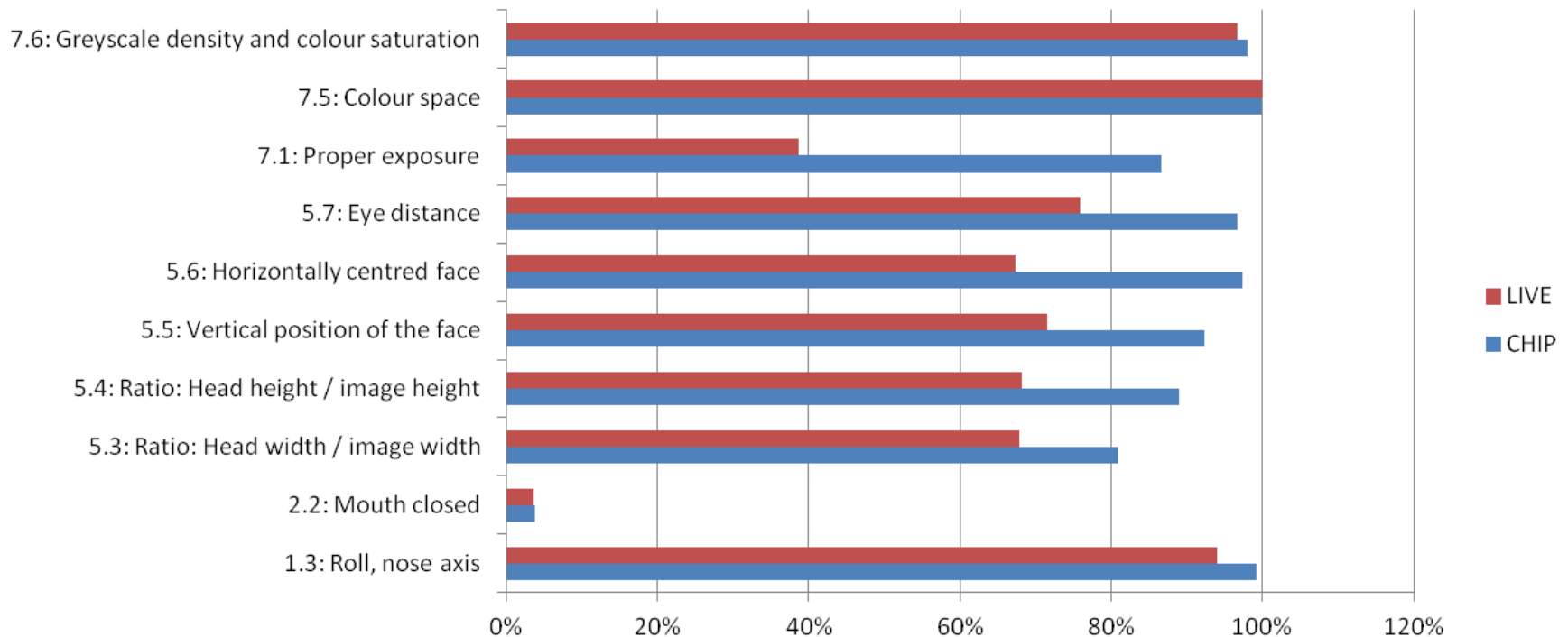- Sometimes not sharp, too close etc.

- Changes to infrastructure
- Handling of camera
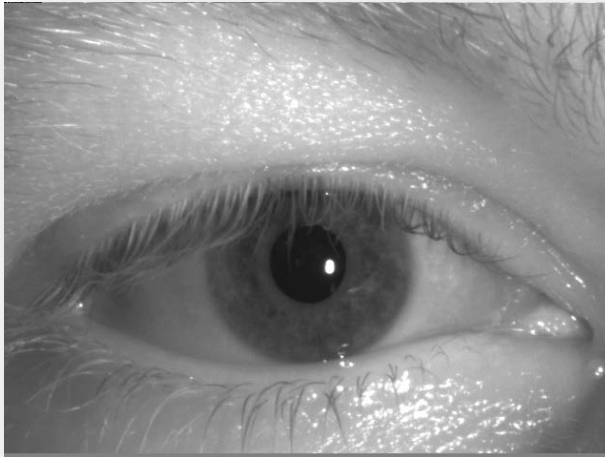
Percentage in Range: Quality Attributes of Chip and Live Images

- Positive
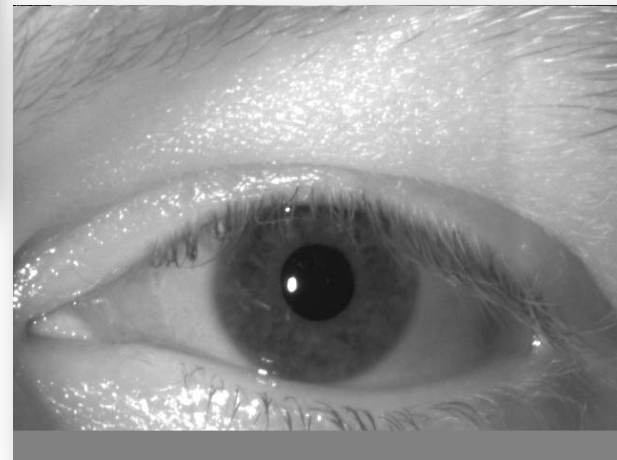- Very robust to environment conditions

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Quality Feature	Adequate quality (score >= 50)	Excellent quality (score >= 75)
Usable iris area	95,29 %	47,13 %
Pupil contrast	99,36 %	41,30 %
Pupil shape	99,87 %	99,87 %
Image sharpness	96,96 %	82,61 %
Iris dilation	7,97 %	0,13 %
Gaze angle	97,09 %	84,96 %

Table 22: Distribution of quality scores for assessed iris images

German Report: Findings & Requirements

- Maximum of available biometrics ("*10fp or 8fp in combination with other*")
- Biometric-driven – <u>not</u> passport-driven
- "Crossover" – architecture (EES, VIS …)
- Long retention period (5 yeas like VIS)
- …
- De-Duplication for 1st line
- Biometric Enrolment:
Reduce threshold, but take "*as much as possible*"

….many more (in the report)

National Plans for 2016

German Smart Borders Pilot –Part Two
Integration of Self-Service-Systems
Adapting to new EU COM Proposal

**EU level:
Negotiation / Design**

… and move towards a better integration

Thank you for your attention!

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