

Equality impact assessment: Template for forces

Live Facial Recognition

How to complete an equality impact assessment

The equality impact assessment (EIA) will help you to evidence your public sector equality duty (PSED) compliance. It is a live document that outlines the way equality has been considered throughout the life of the policy, process or other project (hereafter referred to as 'product').

If you need help, see the accompanying guidance or contact your diversity, equality and inclusion team.

Version control

Version number	Date	Author	Comments
1	30/04/2023	Scott Ashby	
2	09/08/2024	Jennifer Housego	

Overview

Name of product under development or review	Live Facial Recognition (LFR)
Description of the product	Live Facial Recognition software takes images obtained from CCTV cameras, takes the biometric data from facial images obtained, and cross refers them to a pre-loaded watchlist of images / biometric data, highlighting if it is believed that there is a match between the two.

EIA start date	09/08/2024
EIA author and role	Jennifer Housego – Head of Digital Change
EIA owner and role	Stephen Jennings – Authorising Officer
Date of last review	
Date of next review	

Key product development dates

To evidence PSED compliance, equality and inclusion must be considered throughout the life cycle of a product. You can do this by integrating EIA reviews into key product development stages. List your product’s key stages and the dates you will review your EIA here.

Key stage	Date
Post testing and Initial Deployment	30/09/24

Research and evidence

To undertake effective equality assessment that meets PSED compliance standards, you must work from an evidence base. Use this section to list the research you will use to understand the product’s potential or actual equality impacts (for example, surveys, customer feedback, protected characteristic data, academic research).

1. National Physical Laboratory: Facial Recognition Technology in Law Enforcement
[frt-equitability-study_mar2023.pdf \(science.police.uk\)](#)
2. NIST algorithm study results for Corsight algorithm July 2022 (Provided by supplier during procurement in support of PSED evidence)
3. Department of Homeland Security (US) study results for Corsight algorithm July 2022 (Provided by supplier during procurement in support of PSED evidence)

Consultation record

Stakeholder consultation will give you a better understanding of your product’s impacts and is crucial to satisfying the PSED requirements. Use this section to record the engagement you have undertaken, summarise the feedback received and note subsequent actions. This section can also be used to record nil returns.

Name of group or organisation	Date of contact	Date reply received	Feedback	Action taken or reason why no action was taken
Essex Police Independent Data Ethics Committee	16/07/2024	16/07/2024	Approved minutes awaited	TBC pending written advice

General considerations

Use this section to note any general diversity, equality and inclusion activities or considerations that are relevant to the product. Please only document general considerations here. Protected characteristic analysis can be completed in the section below.

Before any deployment of equipment, a watchlist is created. The watchlist is bespoke for every deployment and the rationale for the make-up of the watchlist must be intelligence-led, justified, proportionate and necessary, with the nature of the watchlist recorded prior to each deployment.

The criteria for constructs of watchlists for use with LFR must be approved by the Authorising Officer (the ‘AO’) and be specific to an operation or to a defined policing objective. Watchlists, and any images for inclusion on a watchlist, must also be limited to the categories of image articulated in Force policy documents which are images of people who are:

- a. wanted by the courts; and/or
- b. suspected of having committed an offence, or where there are reasonable grounds to suspect that the individual depicted is about to commit an offence or where there are reasonable grounds to suspect an individual depicted to be committing an offence; and/or
- c. subject to bail conditions, court order or other restriction that would be breached if they were at the location at the time of the Deployment; and/or
- d. missing persons deemed increased risk; and/or
- e. presenting a risk of harm to themselves or others.

CCTV footage obtained as part of the LFR deployment may identify a persons race or religion. However, the footage is only used by LFR to obtain biometric data to compare against the watch list and is deleted with 31 days.

Following the National Physical Laboratory Equitability Study, LFR is deemed to be equitable, with no significant statistical difference across all demographics.

Impact assessment and actions

Apply learning from research, consultation and project knowledge to consider equality considerations relevant to your project. This should include any potential or actual impacts (positive or negative), as well as how the project will uphold the three PSED aims for each of the **protected characteristics**.

1. Eliminate discrimination, harassment and victimization.
2. Advance equal opportunity.
3. Foster good relations between people of different characteristics.

If you have identified a negative impact, note what mitigating action will be taken to reduce or eliminate that impact. If no mitigating action can be taken, please explain why. The issues or impacts identified may change, or new factors may emerge, as your project develops. Use the EIA to document these and how your project has evolved to accommodate equality considerations.

Don't forget to consider intersectionality. This refers to when characteristics overlap to shape experiences of inequality and discrimination. For further information, please refer to the 'Addressing Intersectionality within Policing' report.

Duplicate the boxes below if required. If you need further information about a protected characteristic, open the webpage linked to each subtitle.

All characteristics

Details of positive and/or adverse impact or other issue

Whilst LFR deployments will not target persons owing to any protected characteristics or equality groups, there are issues that may arise because of the deployment that can have an impact. If a group is not listed below, it is because there is no anticipated differential impact on that group:

Age – Facial images uploaded will be sourced whether from existing Essex police records or from family and friends of persons reported as missing. The reference image database, consequently, may have images of subjects that were taken a number of years ago.

The age of criminal responsibility in the UK is 10 years old. Image capture via Custody Imaging on which FRT technology is reliant, is dependent on the age, date and time at which the custody image was taken. In addition, the European Union’s Agency for Fundamental Rights ‘Facial Recognition Technology Fundamental Rights Considerations in the Context of Law Enforcement Report 2019’ highlights that as a child grows and time passes, the accuracy of a biometric match can diminish. The risk of a failure to match increases when facial images recorded at a young age are compared more than five years after they were collected. The report further indicates that the accuracy of FRT is in general significantly lower for children younger than 13 years old. They associate this to “rapid growth and change in facial appearance”.

Disability - People can undergo facial change for several reasons. They may suffer facial disfigurements through trauma or a medical intervention or their face may have reconstructive surgery which would result in a significant change to their facial features. Genetic conditions such as neurofibromatosis also cause progressive facial change. Consequently, the images that Essex Police hold may not accurately reflect their present facial appearance.

Gender reassignment – The Facial Recognition Technology (FRT) probe image is based on the mapping of key facial indicators when comparing a reference image database image for an individual. Therefore, the functionality, accuracy, and performance of FRT may be less effective if changes to facial appearance have occurred between the time the reference image database image was taken, and the time a comparison is made.

This may impact persons who are transitioning from one gender to another if gender presentation differs from the time the comparator image was taken. It may also affect trans, non-binary and gender- fluid people who adopt to flex between gender presentations. Reports suggest that facial contouring using cosmetic make-up application may impact on FRT system’s performance.

Racial Groups – Essex Police is a diverse multi-cultural area which incorporates both rural and metropolitan areas. It is therefore important to ensure that the technology is not seen to cause division between persons of different race/ethnicity.

FRT is based on the mapping of key facial indicators. They are also dependant on the ability of the algorithm to determine the key facial indicators within an image. This can be

impacted by environmental factors such as ambient light and shadows factors. This may also be impacted by the depth of skin pigmentation and the use of contouring make up.

To date ethnicity biases have received considerable attention, particularly from academics and government bodies. Relevant studies include Klare et al (2012), NIST (2018) and Buolamwini and Gebru (2018). The findings from Buolamwini and Gebru's study were widely reported, as they found algorithms were particularly biased in terms of gender and ethnicity: performance was best for men and white individuals, and poor for women and black individuals.

Religion or Belief - The wearing of religious headwear or coverings and the growing of facial hair may have an impact on the effectiveness of FRT. In addition, certain cultures or sexes within a religion i.e. Amish, refuse to allow themselves to be photographed. Sensitivity therefore needs to be taken with cross-community dialogue to ensure the deployment is both necessary and proportionate.

Respect for Diversity Awareness training is embedded Essex Police Culture.

Sex - Social observation indicates women change their appearance more frequently and significantly than men which may impact the performance of LFR. Reports suggest that facial contouring using cosmetic make-up application may impact on the LFR system's performance.

Mitigating action for any adverse impact or rationale for no further action

Equitability

Essex Police has carefully considered issues regarding bias and algorithmic injustice. When considering the algorithm and software used for LFR by other forces (South Wales Police and the Metropolitan Police Service), there have been no observed disproportionately across any particular ethnic group with regards to the generation of false alerts.

Research has been undertaken by the National Physics Laboratory (published April 2023) entitled '*Facial Recognition Technology in Law Enforcement: Equitability Study*'. This research is referred to as the NPL Equitability Study.

The NPL Equitability Study is available via the link:

[frt-equitability-study_mar2023.pdf \(science.police.uk\)](#)

This study shows:

- TPIR (true positive identification rate) of the system at face-match threshold 0.6 is equitable across gender and ethnicity groups.
- FPIR (false positive identification rate) is equitable between gender and ethnicity and age at face-match threshold 0.6 and above.
- At face-match thresholds lower than 0.6 FPIR equitability will depend on settings of the operational deployment, including size and composition of the watchlist, and the number of crowd subjects passing through the zone of recognition during the deployment.

Given the observations on the demographic variation in FPIR, NPL would recommend, where operationally possible, the use of a face-match of 0.6 or above to minimise the likelihood of any false positive and adverse impact on equitability.

The selection of a live facial recognition (LFR) provider by Essex Police had a strong focus on the need to satisfy the PSED and in this context the chosen provider of the LFR software was asked to provide details of any independent bias testing that had been conducted. Currently there is no nationally agreed standard for LFR, and no nationally approved or mandatory testing is available. It is therefore up to individual police forces to make reasonable endeavours to obtain details of any independent testing that has been conducted in relation to their chosen software from the supplier and to ensure that the software is as accurate and free from bias as possible. In addition to ensuring that independent bias testing has taken place, and that the results of the testing are acceptable to the Force in terms meeting the PSED, Essex Police have also developed robust operational policy and procedures to ensure that the criteria for the deployment of LFR and the way it is used by officers helps the Force further reinforce their compliance with the PSED. In addition, work has been undertaken to develop an evaluation framework for LFR which will be subject to independent academic review, and the Force is committed to ongoing testing of the software. Essex Police have also sought advice from their own independent Data and Digital Ethics Committee in relation to their use of LFR generally its deployment.

Essex Police have contracted with Digital Barriers for LFR who provide LFR software from Corsight. Corsight have provided information in relation to the independent testing of their LFR software

Corsight has advised that their “algorithms have been vigorously tested independently for both accuracy and bias by the National Institute of Standards and Technology (NIST) and the Department of Homeland Security (DHS) in the US and have provided details of the results of testing in 2022. In both tests, Corsight’s algorithms were found to have one of the lowest bias differentials available of any algorithm tested. Bias differential is a calculation that distinguishes false-match rates (FMR) between varying demographic groups (gender, skin tone) to distinguish if there is more, or less, likelihood of a false-match when comparing two images of different demographics. The aim of all algorithms is to have a small as possible FMR difference between all demographic categories to ensure there is no more likelihood of a false match between one demographic or another. Within NIST testing, when focusing on bias, every algorithm’s performance is summarized and compared to one another via setting a common FMR (0.0010) on the most likely demographic to give the lowest FMR (Male White: Male White). By doing this, all other demographics are then compared to the same base line to produce an FMR to give a comparable value between algorithms. Within this test, Corsight’s algorithm is identified by NIST as having the lowest bias variance between demographics and is used in every algorithms report as a direct comparison underlying its superior performance.” The NIST report gives the Corsight_003 algorithm a bias differential FMR of 0.0006 overall, the lowest of any tested within NIST at time of writing according to the supplier.

Corsight have also provided details of testing completed by the Department of Homeland Security testing in the US, also in 2022, which was “focussed on testing biometric algorithms in realistic, high-traffic conditions based on varying qualities of image acquisition systems. The Corsight algorithm was top-ranked for accuracy and for being unbiased toward gender or race based on their test conditions. DHS testing is based on system aliases ... It achieved a 99.8% overall Matching True Identification Rate (TIR) and over 99.3% TIR for all skin tone groups across all acquisition systems, and under some acquisition systems had 100% TIR, demonstrating Corsight’ s capability to perform equally across all demographics

With the above findings in mind, the LFR threshold when deployed in Essex by will set at 0.6 or above, as this is the level whereby equitability of the rate of false positive identification across all demographics is achieved.

Code of Ethics

The Code of Ethics sets and defines the exemplary standards of behaviour for everyone who works in policing. The Code of Ethics is about self-awareness, ensuring that everyone in policing feels able to always do the right thing and is confident to challenge colleagues irrespective of their rank, role or position.

Age

Details of positive and/or adverse impact or other issue

Facial images uploaded will be sourced whether from existing Essex police records or from family and friends of persons reported as missing. The reference image database, consequently, may have images of subjects that were taken a number of years ago.

The age of criminal responsibility in the UK is 10 years old. Image capture via Custody Imaging on which FRT technology is reliant, is dependent on the age, date and time at which the custody image was taken. In addition, the European Union’s Agency for Fundamental Rights ‘Facial Recognition Technology Fundamental Rights Considerations in the Context of Law Enforcement Report 2019’ highlights that as a child grows and time passes, the accuracy of a biometric match can diminish. The risk of a failure to match increases when facial images recorded at a young age are compared more than five years after they were collected. The report further indicates that the accuracy of FRT is in general significantly lower for children younger than 13 years old. They associate this to “rapid growth and change in facial appearance”.

Mitigating action for any adverse impact or rationale for no further action

Any watchlist created will be done so as close to the deployment as possible, therefore hoping to ensure the most accurate and up to date images of persons being added are uploaded. If the LFR software highlights a potential match, Police personnel will check the images highlighted for accuracy.

At a threshold of 0.6, the NPL confirm testing shows the false positive identification rate was equitable between all age groups tested.

Disability or neurodiversity

Details of positive and/or adverse impact or other issue
<p>Disability - People can undergo facial change for several reasons. They may suffer facial disfigurements through trauma or a medical intervention or their face may have reconstructive surgery which would result in a significant change to their facial features. Genetic conditions such as neurofibromatosis also cause progressive facial change. Consequently, the images that Essex Police hold may not accurately reflect their present facial appearance.</p>
Mitigating action for any adverse impact or rationale for no further action
<p>Should a person’s face have changed for any of the reasons above (or an additional / different reason) between their image being taken / provided and an LFR deployment, it would ultimately mean that the LFR software would be less likely to highlight a match between the image taken during deployment and that on the watchlist. Should a match be highlighted, this is checked by police personnel for accuracy before additional activity is considered. The reality is that if we were trying to locate someone for safeguarding purposes, wanted persons etc, the software may not highlight a match due to a facial change. There are no actions that can be undertaken to stop this from happening.</p>

Gender reassignment

Details of positive and/or adverse impact or other issue
<p>The Facial Recognition Technology (FRT) probe image is based on the mapping of key facial indicators when comparing a reference image database image for an individual. Therefore, the functionality, accuracy, and performance of FRT may be less effective if changes to facial appearance have occurred between the time the reference image database image was taken, and the time a comparison is made.</p> <p>This may impact persons who are transitioning from one gender to another if gender presentation differs from the time the comparator image was taken. It may also affect trans, non-binary and gender- fluid people who adopt to flex between gender presentations. Reports suggest that facial contouring using cosmetic make-up application may impact on FRT system’s performance.</p>
Mitigating action for any adverse impact or rationale for no further action
<p>Should a person’s face have changed for any of the reasons above (or an additional / different reason) between their image being taken / provided and an LFR deployment, it would ultimately mean that the LFR software would be less likely to highlight a match between the image taken during deployment and that on the watchlist. Should a match be highlighted, this is checked by police personnel for accuracy. The reality is that if we were trying to locate someone for safeguarding purposes, wanted persons etc, the software may not highlight a match due to a facial change. There are no actions that can be undertaken to stop this from happening.</p>

Marriage and civil partnership

Details of positive and/or adverse impact or other issue
There is no anticipated differential impact based on marriage or civil partnership.
Mitigating action for any adverse impact or rationale for no further action
N/A

Pregnancy and maternity

Details of positive and/or adverse impact or other issue
There is no anticipated differential impact based on pregnancy or maternity.
Mitigating action for any adverse impact or rationale for no further action
N/A

Ethnicity

Details of positive and/or adverse impact or other issue
<p>Essex Police is a diverse multi-cultural area which incorporates both rural and metropolitan areas. It is therefore important to ensure that the technology is not seen to cause division between persons of different race/ethnicity.</p> <p>FRT is based on the mapping of key facial indicators. They are also dependant on the ability of the algorithm to determine the key facial indicators within an image. This can be impacted by environmental factors such as ambient light and shadows factors. This may also be impacted by the depth of skin pigmentation and the use of contouring make up.</p> <p>To date ethnicity biases have received considerable attention, particularly from academics and government bodies. Relevant studies include Klare et al (2012), NIST (2018) and Buolamwini and Gebru (2018). The findings from Buolamwini and Gebru's study were widely reported, as they found algorithms were particularly biased in terms of gender and ethnicity: performance was best for men and white individuals, and poor for women and black individuals.</p>
Mitigating action for any adverse impact or rationale for no further action
The NPL findings show that with a threshold setting of 0.6 and above, the false positive identification rate and the true positive identification rate between different ethnicities were equitable.

If the LFR software highlights a potential match, Police personnel will check the images highlighted for accuracy before additional activity is considered.

Religion or belief

Details of positive and/or adverse impact or other issue

The wearing of religious headwear or coverings and the growing of facial hair may have an impact on the effectiveness of FRT. In addition, certain cultures or sexes within a religion i.e. Amish, refuse to allow themselves to be photographed. Sensitivity therefore needs to be taken with cross-community dialogue to ensure the deployment is both necessary and proportionate.

Respect for Diversity Awareness training is embedded Essex Police Culture.

Mitigating action for any adverse impact or rationale for no further action

Any watchlist created will be done so as close to the deployment as possible, therefore hoping to ensure the most accurate and up to date images of persons being added are uploaded. If the LFR software highlights a potential match, Police personnel will check the images highlighted for accuracy.

Should a person be wearing some form of headwear or covering, it could mean that the LFR software would be less likely to highlight a match between the image taken during deployment and that on the watchlist. The reality is that if we were trying to locate someone for safeguarding purposes, wanted persons etc, the software may not highlight a match. There are no actions that can be undertaken to stop this from happening.

Sex

Details of positive and/or adverse impact or other issue

Social observation indicates women change their appearance more frequently and significantly than men which may impact the performance of LFR. Reports suggest that facial contouring using cosmetic make-up application may impact on the LFR system's performance.

Mitigating action for any adverse impact or rationale for no further action

Any watchlist created will be done so as close to the deployment as possible, therefore hoping to ensure the most accurate and up to date images of persons being added are uploaded. If the LFR software highlights a potential match, Police personnel will check the images highlighted for accuracy.

Should a person's face / image have changed for any between their image being taken / provided and an LFR deployment, it would ultimately mean that the LFR software would be less likely to highlight a match between the image taken during deployment and that on the watchlist. Should a match be highlighted, this is checked by police personnel for accuracy. The reality is that if we were trying to locate someone for safeguarding

purposes, wanted persons etc, the software may not highlight a match due to a facial change. There are no actions that can be undertaken to stop this from happening.

Sexual orientation

Details of positive and/or adverse impact or other issue
There is no anticipated differential impact based on sexual orientation.
Mitigating action for any adverse impact or rationale for no further action
N/A

Socio-economic background

Our socio-economic background is a combination of different factors, such as our income, occupation and social background. A person’s socio-economic background can expose them to inequalities, so it’s important to understand how your project could affect different socio-economic groups. Further information about socio-economic status can be found in the Cabinet Office [Measuring socio-economic background in your workforce](#) guidance.

Details of positive and/or adverse impact or other issue
There is no anticipated differential impact based on socio-economic background.
Mitigating action for any adverse impact or rationale for no further action
N/A

Other characteristics

Use this section to consider the PSED aims and any impacts your product may have on characteristics that are not protected under the Equality Act 2010 but are still significant to equality and inclusion. For example, your product may have a particular effect on people with caring responsibilities or on people with English as an added language, or you may need to consider the Welsh Language (Wales) Measure 2011 in delivery. Think creatively and invite input from stakeholders.

Details of impact or other issue
There are no additional anticipated differential impacts.
Mitigating action or rationale for no further action
N/A

Action log

Record EIA actions and monitor action progress in the optional action log.