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 1                                  Friday, 9 December 2022

 2        (10.01 am)

 3                      MR MARK DEGIOVANNI (continued)

 4        LORD BRACADALE:  Good morning, Mr DeGiovanni.  Before you

 5             are asked any questions, can I just remind you that you

 6             are still subject to the affirmation you gave on the

 7             earlier occasion to tell the truth.

 8                 Ms Grahame.

 9                 Questions from MS GRAHAME (continued)

10        MS GRAHAME:  Good morning, Mr DeGiovanni.  You first gave

11             evidence before this Inquiry on 12 May this year and you

12             gave us all your details then, so I won't repeat -- ask

13             you to repeat any of that, but let's look, just to

14             remind ourselves of the PowerPoint presentation which

15             you spoke to that day, and that's SBPI00089 and that

16             will come up on the screen and if we could just look at

17             the first or second page.  Do you recognise that

18             PowerPoint presentation?

19        A.   Yes, I do.

20        Q.   And you gave evidence that day and explained -- can we

21             look at the next page?  You explained the background of

22             Advanced Laser Imaging and then can you carry on,

23             please, to find the -- keep going.  Sorry, I don't

24             have -- that's the one.  You showed us this chart and

25             explained the review that you had carried out on the
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1   work for the Inquiry and there was a yellow section

2   which talked about your 3D digital twin capture and the

3   green section talked about the assessment of objective

4   material as opposed to subjective, and then the blue

5   section you talked about the assessment that you had

6   carried out at the end and you gave detailed evidence

7   about that on 12 May.

8   A.   Yes, that's correct.

9   Q.   Thank you. That was published on -- the whole

10   PowerPoint, I should say, was published on our website

11   at the conclusion of your evidence on that date, so

12   that's available on our website for anyone who wishes to

13   go back over it.

14   A.   Of course.

15   Q.   And then following that you prepared a report, a very

16   detailed report. If we could look at SBPI00149. If we

17   could just go down that page and it says:

18   "Digital Reconstruction - Final Report.

19   "Monday, 13 June 2022."

20   Could you go down to the first page, please. Again

21   it explains who you are, your company, and this report

22   gives all of the detailed information essentially that

23   you condensed into the PowerPoint slides that we have

24   just looked at?

25   A.   That is correct, yes.

 1   Q.   So this is the -- this contains technical information

 2   and more detailed explanations of everything that you

 3   summarised when you referred to your PowerPoint.

 4   A.   Yes, that's correct.

 5   Q.   Thank you. And that will be -- it has been disclosed to

 6   the core participants in June and that will be available

 7   on the website as well.

 8   Now, this is an accurate summary of everything that

 9   you did at that time and that will be available for the

10   Chair to consider in detail at a later stage.

11   A.   Yes.

12   Q.   Thank you. Then during the hearing, after you gave

13   evidence on 12 May, you then returned on a number of

14   days when we were taking evidence from individual

15   witnesses and you assisted the Inquiry with the use of

16   the 3D modelling, is that correct?

17   A.   Yes.

18   Q.   Thank you. So for those who have been present in the

19   hearing room, or maybe watching, you would have been

20   present with your computer, assisting witnesses in

21   explaining their evidence through the mechanism of the

22   3D model?

23   A.   Yes, that's correct.

24   Q.   Thank you. And for the purposes of today you have

25   prepared a second report, effectively updating what you

1   have done since you first gave evidence and during the

2   work of the Inquiry at the first hearing.

3   A.   Yes.

4   Q.   Can we look at SBPI00175, please. And this -- well,

5   this is the -- a second spreadsheet -- sorry, PowerPoint

6   presentation, "December 2022 Update" for the Inquiry and

7   we will look at that in a moment.

8   Then we also have SBPI00169, and if we could go down

9   and we will see this is the second report, supplementary

10   report, Tuesday 4 October, and so this is the

11   supplementary report that you have prepared to update

12   the Chair on the work that you have carried out since

13   your first report.

14   A.   That is correct, yes.

15   Q.   Lovely, thank you. And again, this is a sort of

16   accurate reflection of all of that work?

17   A.   Yes.

18   Q.   That will be available to the Chair. Could we go back,

19   please, to the -- sorry, I should say this was disclosed

20   to core participants on 6 October but it will be put on

21   our website at the conclusion of your evidence today.

22   Can we go back to SBPI00175, please. My intention

23   today, Mr DeGiovanni, is to go through this spread --

24   I keep calling it a spreadsheet, it's Friday; it's

25   a PowerPoint. And I'm going to take you through these

1   slides. Now, I think there are 43, but 42 have content

2   and we will go through each of these in turn. This will

3   be published on the website at the conclusion of your

4   evidence today and I would like to begin by just looking

5   at the next slide, please.

6   We will see that this is headed up -- sorry, that's

7   it. So that's the first slide, "December 2022 Update",

8   and this is the second slide. Thank you. So this is

9   the initial methodology, and if I'm right, that's very

10   similar to that -- that is in fact the slide that we

11   just looked at in your first PowerPoint presentation?

12   A.   Yes, correct, so this was when we started the process

13   and we wanted to explain to the Inquiry what steps we

14   would be doing and what products we would be doing.

15   This is effectively the methodology that we had

16   suggested.

17   Q.   Lovely. And then if we can go on to the next slide,

18   please. This is effectively an updated version of the

19   slide we just saw?

20   A.   That is correct.

21   Q.   So I would like to take you through this, in order to

22   allow you to update the Chair and those listening as to

23   what has been done, so on the first -- if we look at the

24   left-hand side first, we see "Material Review", and

25   I would like you to explain, if you can, the -- on the

1   left there's a turquoise box which says "Snapchat

2   Enhancement (Video) SBPI-00110". Can you tell us what

3   that is?

4   A.   So when we did the material review we looked at all of

5   the evidence that was supplied to us and one thing that

6   drew our attention was specifically one of the Snapchat

7   footage. Once we understood that it was the earliest

8   high quality video that we had of Mr Sheku on the

9   ground, we felt that actually the video in its own right

10   could be improved and could help the Inquiry further, so

11   in that instance we took that Snapchat footage and we

12   applied what's known as sort of a stabilisation to it

13   where we take a point, we fix it within the screen so

14   that effectively it looks like it focuses on that point

15   and that point doesn't move.

16   We also slowed that footage down as well, so it

17   allowed the Chair and it allows the Inquiry to look at

18   that short sequence of events just around the people who

19   are surrounding Mr Sheku at that point in time, but they

20   can review it and they can review it slowly and in more

21   detail.

22   Q.   So we heard evidence about this footage at the first

23   hearing. It was Snapchat footage recorded by

24   Ashley Wyse from a bedroom window in her nearby property

25   and there were clips embedded into your evidence video

1   timeline.

2   A. Yes.

3   Q. And this you took the same footage and produced

4   a version which also went in slow motion?

5   A. Yes.

6   Q. And we also used that in hearing 1 with taking evidence

7   from witnesses.

8   A. Yes.

9   Q. And that wasn't something that you had done in advance,

10   way in advance, we weren't anticipating you doing that,

11   but it was something that you were able to facilitate as

12   matters progressed?

13   A. I think it was something, as we got more involved and we

14   understood more of the evidence and more of the

15   requirements that the Inquiry would have, we felt it

16   would have been useful.

17   Q. So not part of the initial instruction but became --

18   became aware that it would have been useful later?

19   A. Correct.

20   Q. Thank you. And then if we stick with the turquoise

21   coloured boxes, if we look at the right-hand side of

22   this screen can we look -- linked to the yellow "3D

23   Digital Twin Capture" area it says "Scene Overview

24   (Animation) SBPI-00104"?

25   A. Yes.

1   Q.   Tell us about that?

2   A.   So obviously there were many meetings between us and the

3   Inquiry and once we had the 3D model and we were able to

4   show it to them, one of the key questions that came up

5   was is there a way that we can show this as an

6   introduction to witnesses, so we recommended that

7   potentially an animation going through the data,

8   highlighting key areas and key points within that data

9   set would have been useful. That was agreed and we

10   basically proceeded with that, so in the end we decided

11   to produce an animation going through the 2021 survey

12   data set, using the -- we call it a point cloud, but

13   it's effectively a virtual version of the scene and

14   again, just showing it in an animation format meant that

15   it was easier for the Inquiry to use that format when --

16   for example, when I'm not here.

17   Q.   And in fact at the beginning of the first hearing did we

18   use this -- this was effectively the map of the scene

19   that you zoomed in, so you had Scotland at the beginning

20   and you zoomed in to Kirkcaldy and then you zoomed in to

21   Hayfield Road, Templehall Avenue and Arran Crescent?

22   A.   Correct. It's a scene-setter, so it helps people

23   orientate themselves to the location.

24   Q.   And then as you went into that scene, there were

25   elements where you pointed out what appeared to be

1   important areas, such as the nearby garage where

2   a telephone call was made and other areas on the scene.

3   A.   Yes.

4   Q.   And embedded into that screenshots of CCTV footage,

5   mobile phone footage, showing -- well, we have heard

6   evidence now -- Mr Bayoh walking along the street.

7   A.   Yes.

8   Q.   Thank you. So that was something else that wasn't

9   originally part of the first instruction but you were

10   able to provide as it became clear that would be useful

11   to the Inquiry?

12   A.   Yes, that's correct.

13   Q.   And then looking at something else that's linked partly

14   to the yellow and green box, "Still Images Brochures 1

15   and 2. SBPI-00127 & SBPI-00129". Tell us what that

16   was?

17   A.   So once we had created the sort of initial sets of

18   products, our minds turned more to how we were going to

19   utilise this within the setting, within a hearing

20   setting, and I think we're going to go more into detail

21   on that actual process, but part of that methodology was

22   to produce a series of stills of the 3D model that could

23   be used again with or without my absence, but it allowed

24   the Inquiry to put these stills in front of a witness

25   and allow them to take sort of initial positions and add

1   evidence onto that -- those stills.

2   Q.   So again, in the first hearing we would -- using your

3   evidence video timeline and the spreadsheet, the

4   combined audio-video timeline, we would take the

5   evidence of a witness --

6   A.   Yes.

7   Q.   -- they would look at the 3D model on the screen, they

8   would point and -- or with the red circles identify

9   where people had been standing --

10   A.   Yes.

11   Q.   -- with arrows to where they had been moving, and then

12   you created in a break in the hearing still images of

13   those areas.

14   A.   So no, the still images that we're talking about here

15   are the other -- the views that you brought onto the

16   screen that they would actually touch.

17   Q.   Oh, I see, sorry, my mistake.

18   A.   So the still brochures were the ones that you referred

19   to say, page 8, you would bring up on here and then they

20   would put the dots on or the lines on, so it was

21   prepared in advance specifically so that -- as part of

22   that process.

23   Q.   Sorry, that's my mistake. So these were the images from

24   the 3D model --

25   A.   Yes.

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 1      Q.   -- of suitable areas that the witnesses could use in

 2           order to give the evidence?

 3      A.   Correct.

 4      Q.   And it was the still images that were put on the screen

 5           and the witness would then use that to identify with

 6           a red circle where they had been standing?

 7      A.   Correct.

 8      Q.   So these still images were the blank scenes --

 9      A.   Yes.

10      Q.   -- which they would then add things into?

11      A.   That is correct.

12      Q.   Thank you.  Sorry, that was my mistake.

13               Then as we move down on the right-hand side we see

14           "3D Interactive Model".  Can you explain what that is?

15      A.   So after -- I think again we're going to cover this

16           a little bit later, but the second step in the process

17           was where -- or the second and third steps were where we

18           placed 3D models of people within the scene and live in

19           a hearing we would allow people to take different

20           viewpoints and adjust those positions, if they felt that

21           they needed to be adjusted.  All of that was done on

22           that 3D interactive model which allowed us to change

23           positions to get a better viewpoint for the witness and

24           allow them to decide whether the position was correct or

25           how they wanted to move it or rotate a character within
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1   the view.

2   Q.   And was this the part where I would say to a witness

3   "Does that look like a reasonable indication of where

4   you were and where others were?"

5   A.   That's correct.

6   Q.   And you were able to move things around --

7   A.   That's correct, yes.

8   Q.   -- during the hearing space --

9   A.   Yes.

10   Q.   -- until that witness was happy with the image on the

11   screen?

12   A.   Yes, correct.

13   Q.   Thank you.   Then "Evidence Video Timeline (Video)"?

14   A.   So I think we used that again a lot during the

15   proceedings and this is the -- effectively it's a single

16   video containing as much of the audio, video,

17   photography evidence that we could gather, all placed

18   onto a single timeline, so we tried to put it against

19   what we called the real time clock which is effectively

20   the time at which those events would happen.

21   Q.   And that was the footage that I would play with many --

22   all of the witnesses, really, who had been at the scene?

23   A.   That's correct.

24   Q.   And we remember the real time clock had been in the top

25   left-hand corner.

1   A.   Yes.

2   Q.   That's the one. Then "Combined Audio and Video Timeline

3   (Spreadsheet)"?

4   A.   Yes.

5   Q.   And that's the spreadsheet.

6   A.   That's the spreadsheet, yes, taken and based off the

7   evidence video timeline.

8   Q.   And that's also on our website. I have my copy here,

9   it's a little bit dog-eared now but that's also

10   something we were using with witnesses.

11   A.   Yes.

12   Q.   And then it says "Live Reconstruction Images" in the

13   grey box on the bottom right.

14   A.   Yes, so that's more or less what we actually did live in

15   the hearing, so taking the still images, utilising those

16   as one of the steps and then utilising the 3D

17   interactive model as the other to produce a series of

18   images for each witness based on the evidence they gave.

19   Q.   Thank you very much. Apart from what I have drawn to

20   your attention, is there any other areas on this slide

21   which have been updated since you did your first slide?

22   A.   I think mainly we have added the ARLS data in the

23   objective just because, again, that wasn't part of our

24   initial remit. However, once we had reviewed the data

25   and we realised that there may be some benefit to it, we

1   then proceeded down to adding that in as part of the

2   evidence video timeline product.

3   Q.   And if I remember rightly, on the evidence video

4   timeline, the ARLS data was in the top right-hand

5   corner?

6   A.   That's correct.

7   Q.   Thank you. Can we move on to the next slide, please.

8   This is headed up "Inquiry Methodology". You have two

9   boxes there. On the left-hand side "Evidential

10   Considerations". I wonder if you could explain what

11   this shows?

12   A.   So when we're going to -- whatever process we wanted to

13   put into the Inquiry to be used live in these hearings

14   we had to make sure that it was done in a way that

15   didn't interfere with the legal process, it didn't

16   interfere with the witness giving evidence. Things to

17   avoid particularly is leading, so what we didn't want to

18   do is put in place a process, or a methodology which may

19   have affected a witness's evidence in a negative way.

20   An example of that, for example, is if we had an

21   operator moving a cursor round on the screen they might

22   interfere, they might actually draw the witness's

23   attention away from what they're looking at, it may

24   change their evidence, so it was very critical for us to

25   have a step where an operator was not involved, where

1   a screen was just open to the user to just be able to

2   select on that screen and just choose, make their own

3   mind up without any external influences. So that's just

4   an example of leading that again the process needed to

5   avoid.

6   Q.   So that would avoid the witness being influenced, even

7   subconsciously, by the movement of a cursor on the

8   screen, or other items appearing on the screen?

9   A.   That's correct.

10   Q.   Thank you.

11   A.   The other element was that the process that we were

12   going to decide had to be the same for every witness.

13   It had to be fairly rigid in terms of the steps that we

14   went through, but it also had to be flexible enough to

15   allow the Inquiry to ask as many questions as was

16   required, so they're two almost counteracting

17   principles, but you have to try and find a balance

18   between the two.

19   Q.   And so we will come through each witness, come to each

20   witness later, but I think for the majority of the

21   witnesses who were initially at the scene and the steps

22   taken by them, we were able to adopt -- you were able to

23   adopt the same methodology.

24   A.   Correct.

25   Q.   There was one exception to that, wasn't there, that

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 1           was --

 2      A.   Yes.

 3      Q.   -- Mr Paton?

 4      A.   Yes, PC Paton.

 5      Q.   But subject to that, the other witnesses went through

 6           the same process?

 7      A.   Correct.

 8      Q.   And we will come on to this in more detail shortly.

 9      A.   Yes.

10      Q.   Then it says:

11           "Not limiting questions that can be asked of

12           a witness."

13           Tell me what you mean by that?

14      A.   So suppose we only used the first step and we only used

15           the still images that were available, so these are quite

16           far-out stills, the -- there may be questions that you

17           may be asking which weren't covered within those stills,

18           so we need to make sure that we had a process in place

19           which, let's just say you were asking about an area

20           further up by the garage where we hadn't produced stills

21           for, we could still adapt the process to cover those

22           areas as well, so we had a mechanism in place to do

23           that.

24      Q.   So you were building in some flexibility if evidence

25           developed in a particular way and we needed other
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1   images, you would be able to produce those?

2   A.   Correct.

3   Q.   Thank you. And then you said:

4   "Limited information shown initially."

5   You may have touched on that. Just explain what

6   that was --

7   A.   So initially means that we were looking at a two-step

8   process: one where we were going to be looking at the

9   stills taken from a distance and then potentially

10   a second one where we were going to go and dive deeper

11   into the data and try and extract further information,

12   or more detailed information at that point.

13   Q.   And so you weren't producing images to witnesses which

14   suggested where other people may have been standing or

15   otherwise?

16   A.   That's correct.

17   Q.   They had a blank -- other than the scene itself, it was

18   blank and they could put people into that scene as they

19   recalled?

20   A.   That's correct. I think the only addition to that is

21   sometimes we had vehicles in place, but that would only

22   be where we knew that vehicles were in those locations

23   at the time the people were there, so I think that's the

24   only addition to that.

25   Q.   So that was the only exception?

1   A. Correct.

2   Q. And then looking at the blue box, "Practical

3   Considerations":

4   "Operations must be simple and fast".

5   What did that mean?

6   A. So what we didn't want to do is have huge pauses in the

7   evidence being given and what we didn't want to do is

8   have it -- the 3D model was there to support and

9   supplement the Inquiry; it's not there to sort of

10   replace it, so the aim was that everything that we did

11   was just working in the background, it was very simple,

12   it was very fast and almost -- the person giving

13   evidence could just engage with it very easily. Again,

14   if there were sort of long operations, if it took a long

15   time for the data to load or for us to move and find

16   a position, then we don't think that that would have

17   been suitable to be used in a live hearing. So it is

18   a consideration, a practical consideration, that

19   anything that we do fits in with those principles.

20   Q. So the focus for the Chair could be on the witness and

21   their evidence, rather than on the technology?

22   A. Correct.

23   Q. Thank you. And then:

24   "Large pauses in the hearing should be avoided to

25   keep engagement with witnesses."

1   A.   Very similar to the first one, exactly the same reason.

2   We're trying to engage witnesses in a 3D model. If they

3   have to wait for a long time for us to manoeuvre to the

4   right position, or to put a person in place, or,

5   you know, to do anything like that, then we have lost

6   their engagement and that then would have had

7   a detrimental effect to the use of the technology within

8   the hearing.

9   Q.   Right. Buffering can be very annoying, as we all know,

10   I'm sure:

11   "Live assessment will be limited to moving people's

12   positions and/or taxations within the 3D scene."

13   Explain this, please?

14   A.   So I think we touched on this briefly the last time

15   I gave evidence, but what we weren't looking to do is go

16   down to the fidelity of moving arms, moving limbs and

17   that kind of reconstruction, mainly because it takes --

18   again, it takes a long time. The evidence would have to

19   be very specific to back it up and then -- and the more

20   subjective you go with these sorts of details, the less

21   benefit, again, we felt the Inquiry would get to it. We

22   felt that the best solution for us doing this live in

23   a hearing would be to keep the information limited down

24   to just understanding where people were, how they were

25   looking, which way they were facing within the 3D view.

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 1              What that practically meant is that the

 2         reconstructions would run from the first engagement up

 3         to when Mr Sheku is taken to the ground, but it wouldn't

 4         go beyond that because trying to do the holds or how

 5         people moved around the body would get too complex for

 6         a system to be run in real time to carry out that

 7         information.

 8    Q.   So, for example, if we were looking at Mr Bayoh we

 9         wouldn't be trying to replicate arm positions or where

10         his hands were, for example?

11    A.   That is correct.

12    Q.   And equally if --

13    A.   Yes, it isn't that the technology couldn't allow you to

14         do that, it's more that we wouldn't want to be doing

15         that in that space with a witness trying to give

16         evidence in real time.  We didn't feel that that was the

17         best use of the technology.

18    Q.   Right.  And again, bearing in mind you want it to be

19         quick and easy to use, would that -- it may take a lot

20         more time to get that level of detail?

21    A.   Correct, and I felt -- and I think we discussed about

22         this earlier, whenever you needed to get that level of

23         detail you bring them to the front and ask them to

24         demonstrate it and we felt that was a far simpler, more

25         practical way of getting that evidence than us to try to
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1   use the technology to bring that out.

2   Q. So we combined the technology and getting demonstrations

3   from the witnesses, we will all remember, in the body of

4   the horseshoe in the hearing?

5   A. That is correct.

6   Q. Thank you. Can we move on to the next slide, please.

7   Again, this is about your methodology. Looking on the

8   left-hand side, "Step 1: Initial placement". Could you

9   talk us through these bullet points, please?

10 A. So just building on what we have talked about before,

11   based on the principles of what we discussed on the

12   previous slide, we had to decide on a multi-step process

13   for doing this. The initial stage being one by which

14   the court's touch system would be used, alongside with

15   still images to be able to position and place people

16   within the scene. The vehicles were placed based on

17   analysis of Ashley Wyse's Snapchat footage, but there

18   would be a combination of some images with and some

19   images without the vehicles, so that allowed the Inquiry

20   to decide which was the most suitable image for the

21   right witness to be able to gather their evidence. As

22   I said previously, on these stills we used the court's

23   touch screen system. You have got an example down there

24   on the lower right, and you can see where we used

25   a combination of arrows and circles to gather initial

1   positions of where people felt certain events happened

2   at certain -- throughout the sequence of events that

3   they were giving.

4   All of this in terms of its recording was captured

5   as part of the Inquiry's live hearing system, so as

6   these things are being stored and -- recorded and

7   stored, they're actually capturing these locations as

8   well, for record.

9   Q.   Thank you. So in the bottom right-hand corner here we

10   see an image of Hayfield Road from your 3D model and

11   it's a still image. This particular image has a Transit

12   van in the bus stop and also what we came to know from

13   the first hearing as the fish van --

14   A.   Correct.

15   Q.   -- behind, and then we can see the red circles, 3 to 7,

16   near the tree area. They were applied by the witness as

17   they gave evidence --

18   A.   Yes.

19   Q.   -- to that still image, and then also 1 and 2 are the

20   purple arrows showing directions of movement.

21   A.   Correct.

22   Q.   Thank you. And we will remember those. And they have

23   been -- as the witness gave that evidence and touched

24   the screen and made those marks, we have that recorded

25   as part of the live streaming.

1   A.   Yes.

2   Q.   And those are on our website now, so if anyone wanted to

3   watch that, so they have been preserved.

4   Then we look at witness positioning methodology and

5   can you explain what this is?

6   A.   So this is actually how the Inquiry -- yourself engaged

7   with people using this part of the system. As well as

8   positioning using the dots and the circles, you also

9   requested an orientation from them: "Which way were you

10   facing?" would be common, so it's "Where was he

11   standing?" "Which way did he face?" or "Which way did

12   she face?" to try and understand the orientation of it

13   and then you would then talk about pose, and pose could

14   have been something they either demonstrated in the

15   circle, or it could be something they just talked about

16   if it was necessary, you know, sort of "I was standing

17   here, or I was on the ground in this way, or --"

18   you know, other examples. But more or less these were

19   the information that you gathered verbally at this first

20   stage and that was important to feed into the next

21   stage.

22   Q.   And that information assisted you later, which we will

23   come on to --

24   A.   Correct.

25   Q.   -- in inserting characters, coloured blue, green people

 1   into the scene?

 2   A.   Yes, correct.

 3   Q.   Thank you. Let's move on to the next slide, please.

 4   Again, continuing with the methodology used, let's look

 5   at step 2:

 6   "3D Positions Reconstructed."

 7   On the left-hand side. Could you talk us through

 8   these bullet points?

 9   A.   So an operator -- generally it was me throughout this

10   hearing -- would turn the circles and lines that were

11   produced into actual characters, so we would take the 3D

12   model and we would basically reflect the circles and

13   arrows and we put those as characters, based on events

14   as they happened, so it wouldn't be that every slide

15   that was created with all the circles were then put into

16   a single 3D scene because quite often there were too

17   many dots which reflected, say, three or four different

18   events all in one. Some could be reconstructed and some

19   couldn't, based on what was being discussed and what was

20   said. So we would try and reconstruct in the sequence

21   of events that they occurred, the positions of people

22   within the 3D view. The model height or the height of

23   the avatars within the view were based on evidence, so

24   it could have been from their statements, or it could

25   have been from the evidence given at the beginning of

1   their testimony as to their heights, but that would then

2   be used to reflect the height of the characters within

3   the 3D view.

4   Q.   So again, on the bottom left-hand corner we can see

5   a scene of Hayfield Road from a different angle from the

6   photograph we saw in the previous slide, which had

7   circles and arrows on it and -- but this again is

8   a scene from your 3D model that you created?

9   A.   Yes.

10   Q.   And we can see that the green person is on the footpath,

11   so this is a snap shot, if you like, of a moment in

12   time.

13   A.   Yes.

14   Q.   It's not an animation -- I think you said in the first

15   hearing, it's not Pixar or Disney, it's not a cartoon

16   you're creating.

17   A.   Correct. We just want to catch a snapshot of what

18   people are talking about and that's how they basically

19   remembered the scene, they remembered it as a series of

20   snapshots of where people ended up and how they moved

21   and that's how this evidence had to reflect it.

22   Q.   All right. There may be more than one position for the

23   same person being reflected in a particular scene?

24   A.   Correct.

25   Q.   But you were able to show that on this snapshot, and

1   model heights based on evidence, I asked many witnesses

2   for their height.

3   A.   Yes.

4   Q.   Again, that was with a view to assisting you because

5   your technology permits you to put in a particular

6   height?

7   A.   That's correct. For some of the officers we had

8   evidence beforehand as well as to their height, so we

9   had some information before, but that would be confirmed

10   by what was given in evidence as well.

11   Q.   Thank you. Then looking at the purple box it says:

12   "Step 3: Live Adjustment of 3D Positions."

13   And for those of us that were here, we will remember

14   this part, but could you take us through the bullet

15   points.

16   A.   So as sort of mentioned previously, you would ask -- we

17   would go to a view within the 3D model and you would ask

18   them whether it was indicative, or whether they wanted

19   to make an adjustment, so it allowed the witness to

20   effectively look at where we had positioned people and

21   adjust them accordingly and it might be just a rotation,

22   an orientation, or it might be that they want to move

23   two people closer together or further apart and it just

24   allowed them to refine that solution down based on the

25   fact that we now had characters at the correct height

1   now positioned in that scene, so it allowed effectively

2   a refinement of their initial evidence. That had to be

3   done with an operator, so I would be sat generally in

4   that corner over there and I would do the movements for

5   them based on their descriptions and which way they

6   wanted to move it, but always to their direction.

7   Again, as explained before, movements are only

8   limited to position and orientation, so we weren't

9   trying to do anything more than that, but just

10   understand their evidence in terms of where they

11   believed people were at specific times.

12   We did give people an option to use a line of sight

13   view and this is where a virtual camera would drop to

14   the person's line of sight, so would drop to an eye

15   height position and just look in the orientation that

16   they were looking at. It should be noted that we only

17   ever took line of sight for the person giving evidence,

18   so the witness could say "Can I take that line of

19   sight?" and we would take that person's view. What we

20   wouldn't do is we would never have taken the line of

21   sight of somebody else within the view because that

22   witness couldn't comment on that, so it was always

23   a limitation that line of sight could only ever be done

24   on the witness that was giving evidence and all these

25   views were then stored on the digital system for us to

1   retrieve later and produce as a report.

2   Q.   Thank you. Let me just ask you a few more questions

3   about that, if I may.

4   A.   Of course.

5   Q.   So this was the interactive phase of your -- and the

6   method that was adopted?

7   A.   Correct.

8   Q.   And this was the point where you were in the room and

9   the witness would say "Could you move a character

10   slightly to the left, or slightly to the right"?

11   A.   Yes.

12   Q.   And it was providing that refinement of what the

13   witness' position or view was --

14   A.   Yes.

15   Q.   -- to assist the Chair with understanding their

16   evidence?

17   A.   Yes.

18   Q.   And although maybe your technology would allow you to

19   show lines of sight for all sorts of people, you

20   restricted it to only the person who could comment on

21   that actual line of sight?

22   A.   That's correct.

23   Q.   But I understand with line of sight that it's not

24   exactly a replication of the human eyesight.

25   A.   No, the aim of the line of sight is just to get an idea

1   of potential obstructions that may have been in the way,

2   but what we can't do is we can't say that that is

3   a person's vision, or what a person saw, because that's

4   not what the system is designed to do. There are

5   various differences between the way the human eye works

6   and a camera in the real world and a camera in the

7   virtual world, so it is an understanding that it is just

8   a reflection, an idea, and a way of helping that person

9   give their evidence.

10   Q.   So this isn't an attempt to replicate exactly

11   a witness's eyesight, we're not asking for prescriptions

12   or --

13   A.   No.

14   Q.   -- anything of that ...

15   A.   Correct.

16   Q.   So to that extent that line of sight, again, would be

17   indicative rather than an absolutely accurate reflection

18   of their own eyesight?

19   A.   I think we would need to also bear in mind that we have

20   asked to position these people based on memory, so even

21   to the best will in the world, there's huge scope for

22   that to be incorrect and it's just understanding that

23   that really it is a tool to help them understand --

24   you know, and gather their evidence as best we can.

25   Q.   So is it fair to say that it's still a matter wholly for

1   the Chair to actually assess the witness's own evidence?

2   A.   Correct.

3   Q.   Thank you. And again, you said all of this is recorded,

4   this process was recorded as part of the live-streaming

5   of the witness's evidence?

6   A.   Correct, as well as being stored on the digital -- the

7   interactive cloud system as well.

8   Q.   Thank you. Could we move on, please, to the next slide.

9   So this is us, we have dealt with the methodology and

10   the process that was followed with the witnesses during

11   the hearing, and we're now moving on to five slides

12   which will discuss this topic, the Ford Transit van

13   position.

14   A.   Correct.

15   Q.   And so let's start with this one. Can you explain to

16   the Chair what we see on this slide, please?

17   A.   So I believe when PC Walker was giving evidence he

18   noticed that there was an inconsistency between the 3D

19   model and the police vehicle, for the Transit van, and

20   I think in his statement he said that you can see that

21   the passenger rear wheel is touching the yellow line of

22   the bus stop and in the 3D model it isn't. He drew the

23   conclusions that either the line is incorrect or the

24   vehicle position is incorrect. What we did, whilst he

25   was reviewing the evidence is we had a look at the 3D

1   model, we had a look at the evidence and we realised

2   that he was correct in his assessment in terms of the

3   vehicle position was not exactly in the right position

4   and we had to try and work out how that had happened.

5   Here you can see the vehicle and you can see its

6   rear passenger wheel and it's not touching the yellow

7   line as it is within the Ashley Wyse video footage.

8   Q.   So on the left-hand side the heading is "PIRC-00371 -

9   Ashley Wyse Snapchat footage." So this was a still

10   taken from the Snapchat footage which was embedded into

11   the evidence video timeline?

12   A.   That's correct.

13   Q.   And that was taken -- we have heard evidence -- by

14   Ashley Wyse on her phone from a window in her property

15   nearby.

16   A.   Correct.

17   Q.   And on the left we see the original location of the

18   Transit van, so the same van we see on the left-hand

19   side photo --

20   A.   Yes.

21   Q.   -- towards the bus stop, but the rear passenger side,

22   the nearside wheel is not on the bus stop line?

23   A.   That's correct.

24   Q.   And this came out during PC Walker's evidence to the

25   Inquiry?

1   A.   Yes.

2   Q.   Can we move on to the next slide, please. So take us

3   through this please, if you don't mind.

4   A.   So to find out the issue, or where we had gone wrong we

5   needed to break the problem down and we needed to look

6   at each stage separately to understand where the error

7   could have occurred. Our first step was to look at the

8   3D model and to ensure that the 3D model was accurate

9   because that was essential to everything that we were

10   doing and everything that we had put in play, so what we

11   did is we effectively put in a line -- you can see it on

12   the screen as a red line -- and we compared the 3D model

13   to the 2015 laser scan data that was captured, I believe

14   by a road traffic collision unit at the time so --

15   Q.   You gave evidence about that at the first hearing,

16   didn't you?

17   A.   Yes. So we know that -- so what we were looking to do

18   is just to check that the lines aligned and that the 3D

19   model was an accurate reflection of the lines that were

20   there at 2015. In this case they were, so we could rule

21   that out as being the error, the model was accurate.

22   Q.   And so the photo on the right -- the image, sorry, on

23   the right is from the 2015 laser scan data?

24   A.   That's correct.

25   Q.   And that was the first step in checking that your 3D

1   model -- there wasn't an error in that?

2   A.   That is correct.

3   Q.   And you took the view that -- having checked it, you

4   checked that was correct.

5   Let's move on to the next slide, please. So this is

6   "Verify the photogrammetry". Can you explain to us what

7   you did here?

8   A.   So just a very quick recap of how we carry out the

9   photogrammetric process: we take a still from the video

10   footage and we assess that using common points between

11   the scene that's visible within the photograph and we

12   align that photograph to within the 3D view. What we

13   then do is once the two are aligned we look at contact

14   points between a vehicle or a person and the ground and

15   then we try and measure those points and they act as our

16   reference for adding models in, so what you can see here

17   on the left-hand side is an output from the

18   photogrammetry package and in the centre you can see the

19   Ford Transit and you can see three dots which represent

20   the position of the wheels that we have measured within

21   the scene.

22   On the right-hand side you can again see the 2015

23   data set and you can see effectively the three points

24   are marked out as two lines and you can see the corners

25   of those, or the edges -- the corners of those being

 1   those points. The point being that when you look at

 2   that passenger rear wheel, again, it is touching that

 3   line, or it's -- you know, it's in contact with that

 4   line, so again, it showed us that actually the

 5   photogrammetry again was not the cause of this issue.

 6   Q.   So on the left-hand photograph we can see a still,

 7   again, from the Ashley Wyse Snapchat footage, is that

 8   correct?

 9   A.   Correct.

10   Q.   And from that Snapchat footage the photogrammetry has

11   identified sort of white dotted lines?

12   A.   Yes.

13   Q.   And on the Transit van that we can see, the white dotted

14   lines are for the two rear wheels and the front driver's

15   side wheel?

16   A.   Correct.

17   Q.   And then the white line that we see on the right-hand

18   side 2015 data scan image, shows where those two rear

19   wheels would be and the front driver's side wheel?

20   A.   That is correct.

21   Q.   Thank you. And then can we move on to the next image,

22   please. This is "Verification of Vehicle Positioning",

23   and you've got three images here, (a), (b) and (c).

24   Could you talk us through those?

25   A.   So the image (a) is when we first placed the vehicle

1   into the scene and what you will notice is that the

2   wheel is in the right position, it's in the correct

3   position as per the photogrammetry. However, when we

4   put that vehicle in position, one thing that became

5   abundantly clear is that the 3D model that we had used

6   for the Ford Transit wasn't of the correct dimensions.

7   Ford Transits come in various shapes and sizes and one

8   thing that can vary between different models is the

9   wheelbase, so it's the distance between the wheels.

10   The vehicle that the police use is a standard

11   wheelbase, but the model that we had was a long

12   wheelbase, so what we had to do is remove that model

13   from the scene, adjust its position -- or, sorry, adjust

14   its dimensions and then put that back into the scene

15   again.

16   When we put that back into the scene we put that

17   back into, as you can see, in position B and it is in

18   positioning it back into the scene that we have

19   introduced the error. It is a human error, there's no

20   getting away from that. When we put it back in, we did

21   not put it in the right place. Where we should have

22   placed it is shown in (c) and that's where that vehicle

23   should have been put back to, again, back to the lines

24   that were shown in the photogrammetry.

25   Q.   So you discovered where the human error had occurred?

1   A.   Correct.

2   Q.   And it was the different model type --

3   A.   Correct.

4   Q.   -- from the Police Scotland Transit van. You had used

5   a long wheelbase instead of the standard wheelbase

6   model.

7   A.   That's correct.

8   Q.   And is that model something that you have in your system

9   automatically or do you --

10   A.   No, all of the -- again, it's my first report, but the

11   majority of the vehicles that we would use would be sort

12   of third party models. For us to model every vehicle

13   that would be in the scene would be sort of far too much

14   work.

15   What we often do is we go back and we look at

16   manufacturer's details, so we check that the sizes match

17   those, but obviously in the case of a Ford Transit,

18   there are multiple dimensions that are available --

19   Q.   So the wrong wheelbase was selected?

20   A.   Correct.

21   Q.   But having identified that and corrected it, picture (c)

22   is the correct model, the correct wheelbase and in the

23   correct position?

24   A.   Yes.

25   Q.   Right. So that arose because of, I think, PC Walker

 1   identifying that during the course of his evidence, that

 2   was on 19 May this year.

 3   A. Yes.

 4   Q. And in light of that you then carried out this exercise

 5   to double check to see what the issue was.

 6   A. I should also say that when we did recheck the Transit

 7   van we also rechecked all the other vehicles as well as

 8   part of that process and we were happy and content that

 9   they were in the correct position, so it only affected

10   this one vehicle.

11   Q. And from memory, no other witness indicated any problem

12   with the positioning of the vehicle that they had

13   spotted themselves?

14   A. No.

15   Q. Thank you. Thanks very much. Can we look on to the

16   final slide. So this is the final slide about the Ford

17   Transit van position and you just say "Steps taken to

18   Rectify", and just for completeness can you talk us

19   through this.

20   A. So at the point when this was realised, PC Walker had

21   already given the majority of his evidence. We

22   decided -- obviously we couldn't change it quickly

23   enough for him to give his evidence on the corrected

24   position, so we decided at that point any evidence that

25   he had created, we would put a note by it which would

1   reflect that the vehicle is not in the right position

2   for his evidence.

3   We felt that the distance wasn't sufficient enough,

4   so it's not that the vehicle was so far out that it

5   would affect his evidence, but obviously if the Chair

6   felt that, he could have asked PC Walker to come back

7   and redo the exercise if that was necessary, so any

8   evidence that was captured from PC Walker had

9   a supplementary note added to it just to cover off the

10   fact that this error exists.

11   For all other witnesses, the vehicle position was

12   corrected in the still images and in the 3D live view,

13   so when they were positioning themselves through the

14   process we have talked previously, that was all done

15   with the correct position in the corrected -- the

16   correct size vehicle in the correct position.

17   The one area that we couldn't change is in the

18   evidence video timeline. Because of the amount of

19   effort that that would take and the length of time it

20   would take to correct it, it just wouldn't have been

21   possible to move that vehicle and re-render everything

22   and not affect the timetable that the Inquiry is working

23   to. It was felt that the way that tile was being used

24   in evidence it wouldn't significantly affect the Inquiry

25   and its progression, so it was decided that that was an

1   acceptable compromise.

2   Q.   So you raised all these possibilities, bringing

3   PC Walker back and all of that, with the Inquiry and the

4   decision was taken not to go down those very lengthy

5   correction methods?

6   A.   That's correct.

7   Q.   So let me just be clear so everyone understands, in the

8   evidence video timeline, so that's the footage that's

9   combined that we used with the witnesses, the tile in

10   the middle at the top, the little reconstruction tile,

11   the position of the Transit van was not corrected on

12   that?

13   A.   Yes.

14   Q.   And that will be something the Chair will have to bear

15   in mind if he is watching any evidence, or considering

16   any evidence regarding that reconstruction tile on the

17   evidence video timeline?

18   A.   That's correct.

19   Q.   In relation to all of the witnesses after PC Walker gave

20   evidence, the stills and the 3D model, the Transit van

21   was in the correct position?

22   A.   Yes.

23   Q.   So the Chair would not need to consider that for any

24   witnesses after PC Walker?

25   A.   Yes.

1 Q. But for PC Walker himself, the corrected position was

2   not done --

3 A. That's -- yes.

4 Q. -- at that time. So the Chair will have to bear that in

5   mind when he is looking at any of that evidence.

6 A. And hopefully any images that have that in will have the

7   note so that he is aware of that.

8 Q. So you have put a note on that in the images we will

9   come to in a moment in your slides, but it's also

10   detailed in your supplementary report?

11 A. Yes.

12 Q. So there will always be a reminder for the Chair that

13   there was an issue about the position of the Transit van

14   in the first images used with PC Walker?

15 A. Yes.

16 Q. Thank you. Thank you very much. I suppose we should

17   say on the right-hand side you have given us an image

18   which says:

19   "Transparent model shows incorrect position, opaque

20   model is in the correct position."

21   So this shows both the incorrect initial position

22   and the corrected position?

23 A. Yes, that's correct.

24 Q. So the incorrect one is the slightly grey transparent

25   one?

1   A.   Yes.

2   Q.   And then the white opaque one is the correct position?

3   A.   Yes.

4   Q.   And you have given us some little measurements there in

5   terms of the distance between the wheelbase for both

6   those versions?

7   A.   Yes, the rear wheel.

8   Q.   Thank you. Let's move on please to the next slide and

9   leave that Ford Transit van and let's move on to the

10   live reconstruction images. Now, the next session on

11   your slides relates to those reconstructions and it says

12   here:

13   "Witnesses who used the live reconstruction process

14   were ..."

15   And this is the process where you've got the

16   interactive section with the witness that you have

17   described, so it was you've got here PC Walker,

18   PC Short, PC Tomlinson, Mr Nelson and PC Paton and, as

19   we said, Paton is -- there's a variation in relation to

20   that. Can you just explain that?

21   A.   So for PC Paton's evidence I believe it was a closed

22   session, so carried out slightly differently and for

23   that -- for him to be able to do that he covered steps 1

24   in which case -- where we used the stills images to

25   position himself, but he didn't progress or didn't

1   fulfil the requirement to progress to stages 2 or 3. So

2   we have the dots and the positions and the circles for

3   him, but what we don't have is we don't have the

4   corrected positions for his evidence.

5   Q.   So we didn't have the benefit of you sitting in the room

6   with Mr Paton doing the fine-tuning that you did with

7   the other witnesses?

8   A.   Yes.

9   Q.   So for the Chair's purpose he should bear in mind that

10   that part of the process wasn't carried out with

11   Mr Paton?

12   A.   Yes, and we didn't attempt to reconstruct it because he

13   wouldn't have been there to verify it and again, that

14   wouldn't have been a correct process.

15   Q.   So although it would have been possible for you to go in

16   and try and replicate that process, it wouldn't have had

17   the benefit of him looking at the screen at the same

18   time in real time with you in the room?

19   A.   Correct.

20   Q.   So that wasn't done for fear of, what?

21   A.   Yes, so that wasn't done for Paton but it was for

22   others.

23   Q.   Thank you. Then you say:

24   "The brochures, animations and spreadsheet were used

25   with other witnesses but they were not asked to position

1   people."

2   What does that mean?

3   A.   So that's to say that the evidence video timeline, for

4   example, was used, and the spreadsheet was used for

5   multiple witnesses beyond the five people that you see

6   here, so when we're talking about the five people here,

7   we're specifically talking about the live

8   reconstruction, but the other products were used

9   significantly with multiple more -- a few more witnesses

10   who attended the scene.

11   Q.   For example, we heard evidence from a number of

12   witnesses who had made emergency calls to the police,

13   some of which we were able to listen to and we could see

14   Harry Kolberg's dash-cam, the mobile phone footage from

15   his son --

16   A.   Yes.

17   Q.   -- and we used the spreadsheet and the evidence video

18   timeline for those witnesses, but this was not the

19   process that was followed with them, they weren't at

20   Hayfield Road in the events.

21   A.   No, no.

22   Q.   Before we move on to the next images let's just finish

23   the final bullet point:

24   "In the following images the reconstructions are

25   ordered by sequence of events, not by the order that the

1   evidence was given [necessarily] by a witness."

2   A.   Yes.

3   Q.   Tell us about that?

4   A.   So quite often when evidence was given you had asked

5   someone to position themselves, but then you might draw

6   them back to an event that happened previous to that, so

7   what that means is the numbers that came up might be 1,

8   2, 3, 4, but the actual order of sequence of events

9   might be 3 and 4 and then 1 and 2, so what I want to

10   just point out is that just because you see the numbers

11   in sequence in the first panel, that doesn't necessarily

12   mean that that was the sequence of events as they

13   occurred and what we have tried to do is -- when we have

14   gone to steps 2 and 3 -- is show the sequence by event,

15   not necessarily by the order that evidence was captured,

16   so it just means that those numbers might not be

17   sequential or might not be shown in order.

18   Q.   So don't be distracted or confused about the numbers --

19   A.   Correct.

20   Q.   -- which may appear, and so for the Chair's purpose will

21   it be important for him to watch the actual recordings

22   of the sessions, if he wishes to go back over that?

23   A.   I think that would always be useful when looking at what

24   was done, to bear in mind how the evidence was gathered

25   initially and then how that reflected into the 3D model.

 1   Q. Thank you. And before we move on to the next series of

 2   slides, you -- as I understand it, you do consider it

 3   important for the Chair to make all the decisions about

 4   the actual evidence himself --

 5   A. Yes.

 6   Q. -- and not be distracted by the technology.

 7   A. The technology is here to support, it's (inaudible).

 8   Q. Thank you. Let's move on then, first of all, to

 9   PC Walker and the images that were created with his

10   evidence. There's five slides that you have produced

11   and so let's look at that.

12   PC Walker gave evidence on 19 and 20 May this year

13   and I would like to go through these images, so this is

14   slide A, A.1, and you have said:

15   "PC Walker describing the locations of people as he

16   exits the vehicle."

17   Now, at the bottom you've got your note "Ford

18   Transit location is incorrect. See Supplementary

19   Report, section 3 for details"?

20   A. Yes.

21   Q. So you have given the full details again in your

22   supplementary report.

23   A. Yes.

24   Q. Let's just look at the images for the moment. Can you

25   explain to the Chair what we see here, please?

1   A.   So we have two images, one on the left and one on the

2   right, and this will be the format for the next few

3   slides as well. The image on the left will always

4   reflect step 1 of the process, the image on the right

5   will reflect where we ended up at the end of step 3, so

6   step 1 being the using the court's system to place

7   circles and lines onto the fixed image, and step 3 being

8   once the reconstruction has been complete and the

9   witness has been given the opportunity to adjust and

10   move the positions of the people within the scene.

11   In this specific case, so PC Walker was asked to

12   describe where people were as he exited the vehicle and

13   he positioned himself as position 1 on the left-hand

14   screen. He positioned Mr Bayoh as 2 and he -- and

15   PC Paton as 3.

16   What you can then see on the right-hand side are

17   those figures reflected in the 3D view.

18   Q.   So the image on the right-hand side is the end product,

19   really, after the full process has been carried out --

20   A.   Yes.

21   Q.   -- involving you sitting in the room and refining the

22   positions in light of PC Walker's evidence?

23   A.   Yes. I think it should be just noted that wherever we

24   have shown that second image, we have always tried to

25   include that first image as well as a sort of

1   completeness of the record of what was done.

2   Q.   So the first image was a scene, a still from

3   Hayfield Road and the red circles were applied by the

4   witness themselves?

5   A.   Yes.

6   Q.   Independently of you?

7   A.   Correct.

8   Q.   And then the image on the right is the image where you

9   have interacted with the model and, through the evidence

10   of the witness, that has been refined?

11   A.   Yes.

12   Q.   But you have been involved in that process?

13   A.   Yes.

14   Q.   Thank you. You have also, as part of this exercise,

15   indicated in the grey boxes at the bottom where this can

16   be located?

17   A.   That's correct. So if you wish to look back at the

18   evidence, you should be able to find quite quickly

19   which -- where these bits of evidence were captured

20   from.

21   Q.   So, for example, on the left-hand side at:

22   "(a), initial locations identified, PC Craig Walker

23   (pm)..."

24   It was in the afternoon, of 19 May this year, and

25   you have also given the time, and would that mean if

1   someone was going onto our website, for example, to look

2   in the hearings hub, they could identify the evidence of

3   PC Walker and find this part of his evidence at that

4   time?

5   A.   Yes.

6   Q.   Thank you. And again the same on the right-hand side,

7   image (b):

8   "Refined positions. PC Walker (am) 20/5/2022. From

9   02.01.30."

10   A.   Yes.

11   Q.   And again, someone who is looking at the evidence from

12   20 May, the following morning, they should be able to

13   find this aspect of the evidence at just over 2 hours

14   into that session.

15   A.   That's correct.

16   Q.   Thank you. Could we move on to the second of

17   PC Walker's images which should be A.2:

18   "PC Walker describing locations of people as

19   PC Paton deploys CS Spray."

20   Talk us through what we see here.

21   A.   So again, the left-hand view is from one of our still

22   images. You have the roundabout and Gallaghers pub

23   towards the top of the image, so you're looking along

24   Hayfield Road towards the roundabout. You can see the

25   Ford Transit to the lower right. There are three

1   circles that PC Walker positioned for this specific time

2   point and position 3 is his own position, position 1 was

3   Mr Bayoh, and position 2 was PC Paton.

4   Q.   Thank you. And again we see some red lines from a house

5   on Hayfield Road in the image on the left.

6   A.   Yes, they were part of the still brochure because we

7   were requested to -- as well as producing some images

8   with vehicles in, we were also requested to produce some

9   with a few dimensions in as well, so just as part of

10   that still set we had some measurements in there, but

11   they weren't overly relevant or used.

12   Q.   But they are there at that time. I find them a little

13   bit small on my screen, but that will be capable of

14   being viewed later.

15   A.   Yes.

16   Q.   And again, regarding the Transit van, you have properly

17   at the bottom of this image said "Ford Transit location

18   is incorrect ..."

19   A.   Yes.

20   Q.   So again, you're reminding the Chair when he looks at

21   this about the evidence about the Transit van?

22   A.   Yes.

23   Q.   And then on the right, tell us what that image is?

24   A.   So the right image is the final product, or the final

25   step 3 result which shows the corrected positions as per

1   PC Walker's evidence.

2   Q.   Thank you. And again you have kindly given us the date

3   and timing of the location in the live streaming or the

4   recorded footage that these images can be found?

5   A.   Yes.

6   Q.   Thank you. Let's move on to A.3, please. So this is

7   the third of PC Walker's images and it says:

8   "PC Walker describing locations of people as he

9   deploys PAVA Spray."

10   Could you tell us what's on the left here?

11   A.   So again, it's a similar viewpoint to the previous

12   slide, I think it might be the same image even, but

13   critically here we're focusing on positions 6 and 7,

14   where 6 is PC Walker's position and 7 is Mr Bayoh's

15   position and this is the point at which PC Walker says

16   he deployed the PAVA spray.

17   Q.   And is this an example on the left of multiple numbers

18   and red circles appearing?

19   A.   Correct.

20   Q.   But in terms of the refined position, the focus has been

21   on the locations of people as Walker deploys the PAVA

22   spray?

23   A.   Yes.

24   Q.   Thank you. And again, we see the note to remind the

25   Chair at the bottom and also the dates and times of

1   the -- not the times, but how far into the recording

2   they will find the footage.

3   A.   Yes.

4   Q.   Thank you. Let's move on to A.4, please, and this says:

5   "PC Walker describing locations of people post PAVA

6   deployment."

7   So this is after the PAVA has been deployed and

8   sprayed. Tell us what we see on the left first of all.

9   A.   Again, similar viewpoint looking up Hayfield Road

10   towards the roundabout, and here we're focusing on

11   positions 1 and 2 and this was -- PC Walker describes

12   having the effect of the PAVA spray and then he

13   describes a moment of not knowing where he is or how he

14   is moving, but then he says he felt that he ended up in

15   position 1 with PC Walker in position 2, so that's

16   reflected on the left-hand side.

17   Q.   This is -- sorry, PC Walker describing locations --

18   A.   Yes, so basically -- he basically talks about being

19   affected by the PAVA spray and then he says he doesn't

20   know how he got there, but he remembers himself being by

21   the rear passenger wheel of the Ford Transit, and

22   PC Paton being to his side and those were the

23   positions -- 1 and 2 are the positions that he

24   identified on the left-hand side and then they're

25   reflected onto the 3D model onto -- into part (b) on the

1   right side.   52

2   Q. So on the right-hand side image we can see two blue

3   characters.

4   A. Yes.

5   Q. The one on the left as we look at this image has the

6   name PC Walker at the top?

7   A. Yes.

8   Q. And the one at the right has PC Paton at the top?

9   A. Correct.

10   Q. And again these are -- these were refined positions in

11   light of PC Walker's evidence?

12   A. Yes.

13   Q. But again, you have put the note at the bottom of this

14   slide for the Chair to bear that in mind.

15   A. Yes.

16   Q. And again, you have given us the dates that the evidence

17   was given and the place within the recording that it can

18   be found.

19   A. Yes.

20   Q. So again, it's a snapshot of a moment that was described

21   by the witness, but again on the left-hand side image we

22   can see multiple red circles that maybe talk about

23   different phases.

24   A. Yes.

25   Q. Thank you. Can we look at the final image from

1   PC Walker's evidence please. This is A.5:

2   "PC Walker describing location where PC Short fell

3   and was allegedly stomped."

4   Now, could you describe what we see on this final

5   image from PC Walker.

6   A.   So on the left-hand side you can see -- on the left-hand

7   image you can see the roundabout to the right-hand side

8   of that image, or you can see the line markings of that

9   roundabout, so we can see Hayfield Road approaching the

10   roundabout from left to right and on there you've got 1

11   and 2, 1 being PC Short's position when she fell and was

12   allegedly stomped and then position 2, Mr Bayoh's

13   position when he allegedly stomped PC Short.

14   When we go on to the second image, so we look on the

15   right-hand image, we are actually looking from the other

16   side of the road, so we're looking from the houses' side

17   into the road, so you can see the initial split in the

18   line marking on the left-hand side of that image and you

19   can see the Ford Transit van to the right-hand side of

20   that image.

21   Q.   Where is the roundabout on the right-hand side image?

22   A.   So it's to the left of that image, so --

23   Q.   But on the left-hand image, the roundabout is on the

24   right?

25   A.   Yes, it's going to get a bit confusing. If you imagine

1   looking from -- if you take the left-hand image and you

2   imagine looking from just above the houses back into the

3   view then that's the view that you see on the right-hand

4   side.

5   Q. And is it fair to say -- and people may recall -- that

6   sometimes witnesses changed images to make it easier for

7   them to give evidence?

8   A. Yes.

9   Q. So looking at the right-hand image then, I see the green

10   character is Mr Bayoh?

11   A. Correct.

12   Q. And the blue character is PC Short?

13   A. Yes.

14   Q. Thank you. And tell us what we see other than that in

15   the right image.

16   A. So as already explained, some of the poses and some of

17   the -- were -- sorry, let me start again. Beyond

18   capturing position and orientation, the poses or actions

19   that were carried out were sometimes demonstrated within

20   the horseshoe, as you have described earlier. As I said

21   before, the point of our technology isn't just to do

22   everything in 3D. Where we can include -- where people

23   have given demonstrations, it's a lot easier just to

24   show that within the view, so what we have done is we

25   have captured a still and it should note that it is just

1   a still of the reconstruction carried out by PC Walker

2   of the alleged stomp. Maybe we tried to capture it at

3   sort of the highest point of the stomp to show that

4   element of it, but obviously you asked him to

5   demonstrate things like the force and things like that,

6   so there are things that won't be captured just in the

7   still, but it gives an idea of the moment that PC Walker

8   is describing when he is describing these events.

9   Q.   Right. So in the image on the right we can see the

10   green character is said to be Mr Bayoh.

11   A.   Yes.

12   Q.   But during PC Walker's evidence, I asked him to do

13   a demonstration in real life in the hearing space and in

14   the grey box below this image we see that you have said:

15   "Refined positions, PC Walker [in the morning on

16   20 May, 2 hours 13 minutes into the footage]."

17   And:

18   "Inset PC Walker demonstrating the alleged stomp."

19   And you have given PC Walker in the morning of

20   20 May, 31 minutes in. So you have not only given

21   a reference for the chair of when the image can be seen

22   on the screen, but also when he can find the

23   demonstration that can be seen and this is only a still

24   of PC Walker's demonstration of what he said he saw

25   Mr Bayoh do.

1   A. Yes.

2   Q. But that's not part of the process with the 3D model as

3   question see Mr Bayoh standing is a green figure on the

4   3D model but just standing?

5   A. Correct.

6   Q. So the Chair will have to look at both --

7   A. Yes.

8   Q. -- together to get a full picture?

9   A. Yes.

10   MS GRAHAME: Thank you. Lovely. Well, I would like to move

11   on now to the next series of images from the evidence of

12   PC Short.

13   I wonder if that would be a suitable --

14   LORD BRACADALE: If that's a convenient point we can take

15   a break. So a 20-minute break.

16   (11.17 am)

17   (Short Break)

18   (11.45 am)

19   LORD BRACADALE: Yes, Ms Grahame.

20   MS GRAHAME: Thank you. We were just about to move on to

21   the series of slides in relation to PC Short's evidence,

22   so if we could move on to that. I think I have it as

23   seven slides beginning with number 18, but I might be

24   wrong. That's it, excellent. So we're calling this

25   B.1, "PC Short's Images". Now, PC Short gave evidence

 1   to the Chair on 24 May this year and I would just like

 2   to go through these seven slides please, so B.1:

 3   "PC Short describes locations of people as she exits

 4   her vehicle."

 5   We heard from PC Short that she was a passenger in

 6   the fish van, the smaller van behind the Transit van --

 7   A.   Yes.

 8   Q.   -- which we can see here. Describe to the Chair,

 9   please, what we see here?

10   A.   So as per previous images on the left-hand side we have

11   the stage 1, or step 1 image where PC Short has

12   indicated the location of Mr Bayoh shown as position 3.,

13   position 2 as PC Paton and 1 as Walker. We can see,

14   again, just looking at that image, we can see that we're

15   looking at Hayfield Road with the roundabout to the

16   left-hand side of that image.

17   On the right-hand side we can see the reconstructed

18   view with PC Short added to her location just exiting

19   the vehicle. This was done so that she could take her

20   line of sight and take a view into the scene so she

21   could make adjustments, or affirm or disagree with what

22   had been created and again, you can see -- so you can

23   see PC Short by the fish van and you can see PC Paton

24   and PC Walker by the Transit and Mr Bayoh by the tree.

25   Q.   And the small insert on the right-hand side, is that the

 1   line of sight you mentioned?

 2   A.   That's the line of sight image taken from Nicole Short's

 3   position.

 4   Q.   Now, again, can you tell me, is that taken as a line of

 5   sight with the height adjusted for PC Short?

 6   A.   Yes, so that's taken from an eye height position of

 7   someone of her height.

 8   Q.   So her height is put into your model, but obviously not

 9   her particular prescription --

10   A.   Yes.

11   Q.   -- if I can say that.

12   A.   Yes, I mean what the software does is it works out

13   the -- so if you put the height of the person in, it

14   work out their eye height based on a percentile value,

15   so it understands that height, but obviously it's not

16   taking into account the fact that it is a person with

17   two eyes, or those sort of human vision issues that we

18   discussed earlier.

19   Q.   But this -- the vision -- the images on the right-hand

20   side were discussed in the evidence of PC Short and

21   again, you have given us in the grey box at the bottom

22   the reference where that can be found for the Chair to

23   consider at a later date?

24   A.   Yes.

25   Q.   Thank you. And then moving on to B.2, please.

1   "PC Short describes movement of Mr Bayoh along

2   path."

3   Tell us what we see here?

4   A.   So in the image on the left, again we've got the

5   roundabout to the left-hand side, and she described

6   this -- I would like to say shadowing, I can't remember

7   quite her word for it.

8   Q.   I think -- I will be corrected if I'm wrong -- it was

9   mirroring?

10   A.   Mirroring, correct, yes, I remember now. She talked

11   about mirroring his movement, so she talked about him

12   moving along a path and then she talked about herself

13   mirroring his movement, possibly somewhere behind him,

14   so we started to recreate that area of her evidence and

15   the reconstruction she came up with was on the

16   right-hand side which showed her still on the path

17   but -- on the pavement but it showed Mr Sheku walking

18   along the path.

19   Q.   So just to be clear, on the left-hand side image we can

20   see 1 and 2 and you have given the boxes:

21   "(1) Movement of PC Short mirroring Mr Bayoh's

22   movement."

23   A.   Yes.

24   Q.   And then:

25   "(2) Movement of Mr Bayoh along path."

 1   A.   Yes.

 2   Q.   And then on the right-hand side these are the refined

 3   positions and that evidence was given by Nicole Short in

 4   the afternoon of 24 May and the green figure is

 5   Mr Bayoh's position as he starts moving along the path

 6   and the blue figure is PC Short's position as he had

 7   started moving along the path.

 8   A.   Yes.

 9   Q.   And I should have said in relation to the earlier image

10   as well, in these stills, the Transit van position has

11   been corrected?

12   A.   Yes.

13   Q.   So for all of the stills that we now see moving forward

14   in your PowerPoint, the Transit van has been corrected?

15   A.   That's correct.

16   Q.   Thank you. So the Chair will not see the note at the

17   bottom of these slides to remind him.

18   A.   Yes.

19   Q.   Thank you. Let's move on to B.3:

20   "PC Short describes locations of people as Mr Bayoh

21   reaches furthest point along path."

22   So this is a dynamic situation that's being

23   described and tell us what we see in your slides here --

24   on your slide here?

25   A.   So again, the image on the left is from the same

1   viewpoint as the previous images. We have still got

2   lines 1 and 2 which reflected the mirroring, the walking

3   along, and then we've got some further information where

4   PC Short described, I believe, the furthest point that

5   Mr Bayoh walked along the line, so that was represented

6   by 6, her position, which was 7, she refers to

7   PC Tomlinson's position as 3, and then PC Walker's

8   position as 4, and obviously this is all surrounding the

9   fish van which you can see in the middle of that screen,

10   of that view. Then on the right-hand side again you can

11   see that fish van on the sort of -- fairly central to

12   the image. You can see that we're looking from the path

13   towards the road, so you can just about make out the

14   roundabout and the pub towards the right-hand side of

15   that image. Again, Mr Bayoh is in green, PC Short is in

16   the grass space between the path and the pavement,

17   PC Tomlinson is just beyond her, and PC Walker is next

18   to the fish van.

19   Q.   On the left-hand side image I see that you've got 3, 4,

20   6 and 7 listed?

21   A.   Yes.

22   Q.   And the numbers on the image itself that indicate red

23   circles have 3, 4, 5, 6 and 7.

24   A.   It's -- I think 5 reflects a different part, or

25   a different part of the sequence and it doesn't reflect

1   on this part of it. I mean, obviously as we've got the

2   timings on there you can go back and look at the

3   original evidence, but I believe 5 is where PC Short

4   says she ends up, and I believe we covered that in the

5   next sequence.

6 Q. All right, thank you. So this is a snapshot as Mr Bayoh

7   is on the path moving towards the furthest point.

8   Thank you.

9   Let's move on to the next slide please, B.4:

10   "PC Short describes her position on the road before

11   turning to run, with Mr Bayoh 'closing the gap'."

12   And that's in little italics or speech marks,

13   quotation marks. Is that a description taken from the

14   evidence?

15 A. I believe that would have been a phrase that was used by

16   her in evidence, so that's why we would have reflected

17   it in that way.

18 Q. Right. And again, tell us what we see on this slide.

19 A. So again, similar viewpoint on the left-hand side, in

20   fact, it's exactly the same image and you will notice

21   that now we only refer to position 5, which is PC Short

22   referring to the fact that she shuffled back before

23   turning to run, so we're sort of describing the events

24   as they're building up and so she is talking about

25   moving backwards and then she is talking about Mr Bayoh

1   coming closer towards her, so what we have then done is

2   we have positioned her in position 5 and then she has

3   positioned how close Mr Bayoh came to her before she

4   turned and ran, and that's reflected in the right-hand

5   image.

6   Q. So again, a dynamic event, but these are stills where

7   you have replicated a moment in that?

8   A. Correct.

9   Q. And so to help the Chair, he would be perhaps best

10   advised to go back through the particular evidence and

11   to review that as part of considering these images?

12 A. Yes, yes. Particularly when we go from one still to

13   another, she will have described what she believed

14   happened in-between, but it may not be something that we

15   could replicate, or it might be that it is something

16   that it isn't sort of a specific point in time, which

17   then becomes very difficult for us to put that into a 3D

18   view.

19 Q. Thank you. And again to assist the Chair in the grey

20   boxes, you have given the date and also the period in

21   which the footage should appear.

22 A. Yes.

23 Q. Thank you very much. Let's look at B.5, please:

24   "PC Short describes where she ran to and where she

25   landed in the road."

1   Tell us what we see here.

2   A.   So the image on the left we can see that again we're

3   looking from the houses down, you can see the roundabout

4   to the left-hand side and PC Short has marked position 1

5   as the position where she fell after she was struck.

6   That's then reflected in position 2 -- sorry, in the

7   right-hand image where we can see a person sort of

8   laying flat down on the floor.

9   As you will note, we have not tried to replicate

10   pose, it's just the rotated model face down on the

11   ground to reflect that she is in that ground position.

12   I believe the second vision is where -- let me just

13   see ... so she was also requested to locate her position

14   where she was struck and this was added into the 3D

15   view. I don't believe she was asked that in the initial

16   stage, so I believe that's something that we added

17   during that evidence, but we can go back and review that

18   to be sure that's the case.

19   In the inset you can see Nicole Short showing the

20   pose as she landed, or as she fell to the ground.

21   Q.   So again, the right-hand image is a refinement --

22   A.   Yes.

23   Q.   -- and maybe contains two moments in time in a dynamic

24   situation?

25   A.   Yes.

1   Q.   And the small insert is her own personal demonstration

2   during the hearing, but again, that will have been

3   something that was demonstrated here in the horseshoe

4   and again, you have given the Chair the detailed areas

5   where he can consider and reflect on that footage?

6   A.   Yes. I think it should also be recognised that she

7   demonstrated multiple poses of a sequence of events that

8   happened past this point. We're just showing the point

9   that she initially fell and the pose that she said that

10   she formed at that point.

11   Q.   So some people may have watched the evidence at

12   hearing 1 and thought she also demonstrated lying on her

13   right-hand side.

14   A.   Correct.

15   Q.   But that's something that the Chair will be able to find

16   on the 24 May footage, 37 minutes into her evidence?

17   A.   Yes.

18   Q.   Thank you, thanks very much.

19   Can we look at B.6 please:

20   "PC Short describes the area of restraint and her

21   immediate position after getting up from the ground."

22   Now, we see three images on this slide. Could you

23   talk us through this, please?

24   A.   So on the left-hand side we've got two images. The

25   upper image is where she felt the restraint was taking

1   place and so that was the position she identified. The

2   bottom position is her description of when she gets from

3   the -- gets up from the ground and where she moves to,

4   and those two positions are -- those two positions were

5   carried out on different images, hence they've got --

6   they are both labelled as (1) and they are different

7   images, but we have combined that into a single image on

8   the right-hand side.

9   Q.   And on the right-hand side again we can see the

10   roundabout is on the left.

11   A.   Yes.

12   Q.   There's a blue character behind the fish van which is

13   PC Short, and a green character on the ground which is

14   Mr Bayoh?

15   A.   Yes.

16   Q.   And again, the refined positions and the original

17   positions are listed in the footage.

18   A.   Yes.

19   Q.   Thank you. Can we look at B.7, please:

20   "PC Short describes moving away from the 'Fishvan'

21   (Ford Connect)."

22   And talk us through what we see on this slide?

23   A.   So she was -- she produced this on the left-hand side,

24   same as previous, this is step 1, and she produced an

25   arrow showing her movement from the back of the fish van

1   across to what appeared to be near the bus stop. What

2   we then did is we go to her actual position and she

3   talked about her line of sight being blocked by the

4   Transit van, so if you remember correctly we tried to

5   move her into a position that that would have been the

6   case and we couldn't do that but then she talked about

7   being next to a tree and she said she remembered

8   branches being over her head -- I'm paraphrasing.

9   Q.   Obviously it will be a matter for the Chair to look at

10   this.

11   A.   Correct. So we positioned her underneath the only tree

12   that seemed to make sense, the one over here, and then

13   we have taken a line of sight back towards the

14   roundabout and towards the restraint within the inset of

15   that right-hand image.

16   Q.   And so in the inset on the right-hand image we can see

17   the line of sight from the position of PC Short under

18   the tree?

19   A.   Yes.

20   Q.   And we can see on the left of that inset most of the

21   Transit van on the left?

22   A.   Yes.

23   Q.   And then the fish van to the right?

24   A.   Yes.

25   Q.   Thank you. And that's an indication, as you have said,

1   about line of sight of the witness?

2   A. Correct.

3   Q. Thank you very much. Looking on the next series of

4   slides, we're moving on to PC Tomlinson's images and

5   there are nine slides in relation to this that you have

6   gathered together. He gave evidence on 25 and 26 May

7   this year and I would like to -- let's start with C.1:

8   "PC Tomlinson describes locations of people after

9   exiting his vehicle."

10   Tell us what we see here?

11   A. So on the left-hand image, again, we're looking at

12   step 1. We can see the roundabout or the line-work

13   leading to the roundabout on the left-hand side of the

14   image. Position 1 is PC Tomlinson exiting the vehicle;

15   position 2 was a representation of PC Short leaving her

16   vehicle -- leaving the passenger side of the vehicle;

17   position 3 is PC Walker's position, and position 4 being

18   Mr Bayoh's position.

19   That's then reflected onto the 3D positions, so we

20   have PC Tomlinson in the background next to the fish

21   van, we can see the bus stop towards the lower end of

22   that image, and in front of that we have PC Walker and

23   Mr Bayoh effectively facing each other.

24   Q. And throughout is Mr Bayoh represented by green as

25   a character?

1   A. That's correct.

2   Q. And again, it goes without saying the Ford Transit van

3   position has been corrected?

4   A. Yes.

5   Q. Let's move on, please, to C.2:

6   "PC Tomlinson describes Mr Bayoh walking up the

7   path."

8   Talk us through this slide, please.

9   A. So again, we've got quite a few positions that have been

10   captured, but the ones that are relevant to this moment

11   of time are positions 5, the circle 5 and the arrow 6

12   where PC Tomlinson's described his position and he has

13   described the movement of Mr Bayoh.

14   We have chosen a position for Mr Bayoh along the

15   path, obviously we can't show an animation -- or we

16   weren't showing animations, so PC Tomlinson's position

17   is reflected on the right-hand side and Mr Bayoh's

18   position is reflected as he walks up the path.

19   Q. So this was -- in giving this evidence PC Tomlinson was

20   describing a dynamic situation and on the left-hand

21   side, the number of circles and the purple lines reflect

22   the movement and the various positions of people?

23   A. Yes.

24   Q. And then on the right-hand side you have selected

25   essentially one snapshot of one moment in that

1   description?

2   A.   That's correct.

3   Q.   And in this case, it's where PC Tomlinson was and where

4   Mr Bayoh was at that one moment.

5   A.   Yes.

6   Q.   And you have given again the -- you have identified the

7   date and the area of footage that the Chair could

8   consider to consider the whole passage of evidence?

9   A.   Yes, that's correct.

10   Q.   Right, thank you. C.3, please:

11   "PC Tomlinson describes Mr Bayoh walking up the

12   path."

13   Talk us through this, please.

14   A.   So the image on the left is the same as you saw

15   previously. Again, there's a huge amount of detail

16   captured on this slide but critically what we're looking

17   at here is 7, 8, 9 and 10, so towards the left-hand side

18   of this image, and trying to capture again that movement

19   of Mr Bayoh, and then in reflection to that,

20   PC Tomlinson and where he felt PC Short was at that

21   time.

22   On the right-hand side -- so on the -- just to cover

23   the left-hand side a little bit more, PC Tomlinson

24   described PC Short as being somewhere behind him, but he

25   couldn't say where, so he gave her as positions 9 and 10

1   on the left-hand side, but just obviously knowing that

2   she was somewhere behind him, but wasn't quite aware of

3   where she was.

4   In the right-hand side we have just reflected that

5   by a single position and just allowed him to comment,

6   but that's just something to bear in mind when looking

7   at this slide.

8   Q.   And to assist the Chair, have you put a note at the

9   bottom of this slide:

10   "PC Tomlinson knows PC Short is behind him, but not

11   sure where."

12   A.   Correct.

13   Q.   So when the Chair comes to look at these images, again,

14   this note will remind him --

15   A.   Yes.

16   Q.   -- that this is just a snapshot of one option?

17   A.   And in conjunction with reviewing the timings and the

18   evidence given by the witnesses as well.

19   Q.   Yes. And again to help the Chair you have given those

20   periods in the footage that he can use.

21   A.   Yes.

22   Q.   Thank you. Let's move on to C.4, please:

23   "PC Tomlinson describes Mr Bayoh turning to face him

24   after PAVA Deployment."

25   Talk us through this slide.

1   A.   So on the slide on the left, PC Tomlinson gave two

2   possible positions for himself. These are positions 1

3   and 2, and it's basically talking about where he adopted

4   this defensive stance with his spray, and then position

5   3 would have been Mr Bayoh's position as he is walking

6   along the path.

7   On the right-hand side we can see a similar

8   viewpoint just closer in where PC Tomlinson has been

9   able to review his position and he talked about an

10   opening where Mr Bayoh could come through, so he has

11   assessed that this is probably the most likely position

12   for him, the most likely position for Mr Bayoh at that

13   point.

14   Q.   And it is that refined position given by PC Tomlinson

15   that appears on the right-hand image?

16   A.   Yes.

17   Q.   Thank you.

18   C.5, please.

19   A.   Just on -- sorry, just before we do that, just one

20   point, I think, is on the left-hand image there's a lot

21   of descriptions about his position before he did his

22   spray. I believe the positions that we identified were

23   when or after he used his spray, so it's just

24   a slight -- again, a slight difference to when we

25   captured the first bit of evidence to when we did the

1   second, although, they are sort of momentary lapses, but

2   it's to understand that there is that slight nuance

3   between the two.

4   Q.   So again, to assist the Chair, it would be helpful for

5   him to look at the actual footage of evidence from

6   PC Tomlinson --

7   A.   Yes.

8   Q.   -- when he is reflecting on any images that were

9   created?

10   A.   Yes.

11   Q.   Thank you. C.5, please:

12   "PC Tomlinson describes Mr Bayoh passing him to his

13   right side."

14   Talk us through these images, please.

15   A.   So on the left-hand side we're talking about the

16   circle 1 and the line -- or the arrow 4, talking about

17   Mr Bayoh's movement and the distance from which Mr Bayoh

18   came to PC Tomlinson. I think he talks in quite detail

19   about that distance and hopefully that's reflected on

20   the right-hand side in the distance between PC Tomlinson

21   and Mr Bayoh.

22   Q.   And this was as Mr Bayoh was moving past PC Tomlinson?

23   A.   Correct, yes. Again, we've got an arrow showing that

24   movement is as number 4, but we're trying to just,

25   again, pick snapshots, so we're talking about just the

1   moment that he walks by him.

2   Q.   And again, as you have said with other slides, important

3   to consider the evidence of the witness --

4   A.   Correct.

5   Q.   -- to understand the nuances of these slides?

6   A.   Yes.

7   Q.   C.6, please:

8   "PC Tomlinson describes PC Short being struck and

9   going to the ground."

10   Talk us through this moment.

11   A.   So on the left-hand slide we're looking at positions 5

12   through to 8.

13   Q.   So is this the same image as we saw in the previous

14   slide but a later moment in time that we're focusing on

15   here?

16   A.   That's correct, yes. So 5 is PC Short's position where

17   PC Tomlinson believes that she was struck, and saying

18   that effectively she fell to the ground to position 6 or

19   7, and then described the angle at which PC Short fell

20   as being 8, so effectively away from the roundabout

21   slightly, so towards that angle. So that was what we

22   gathered in step 1. After the refinement, we had

23   a position of Mr Bayoh behind PC Short, demonstrating

24   the approximate distance when the strike occurred, and

25   then the position of PC Short when she fell to the

1   ground and where she fell to the ground.

2   Q. So on the left-hand image the roundabout is to the left?

3   A. Yes.

4   Q. On the right-hand image, the roundabout is at the top in

5   the distance?

6   A. No, it's the other way round. So on the right-hand

7   image we're looking from the roundabout towards -- down

8   Hayfield Road, so you can see the bus stop on the upper

9   left-hand side, so we're looking towards the bus stop.

10   Q. Sorry, I have a terrible sense of direction. So the bus

11   stop is in the distance --

12   A. Yes.

13   Q. -- up Hayfield Road, the roundabout would be behind

14   that -- the person if they were looking at that image?

15   A. Yes.

16   Q. Sorry. Thank you very much. And that is the fish van

17   on the -- to the left of the characters that we see on

18   the right-hand image?

19   A. Yes.

20   Q. And we can see the fish van in the centre of the

21   left-hand image?

22   A. Yes.

23   Q. Thank you.

24   Can we look at C.7, please. Talk us through this.

25   A. So we're talking now about PC Tomlinson describing the

1   alleged stomp. In the left-hand side you can see

2   position 3 is where PC Tomlinson positions himself;

3   position 1 being PC Short's position on the ground and

4   [position] 2 being Mr Bayoh's position to her side.

5   Again, we're looking at this image with the roundabout

6   to the left-hand side of that image.

7   Q.   Thank you.

8   A.   When we come to the right-hand image we are now looking

9   towards the roundabout, so the roundabout is towards the

10   upper end, so we have rotated around. You can see the

11   location of the fish van on the right-hand side of that

12   image and in front of here we can see the corrected

13   positions by PC Tomlinson who in this correction

14   positions himself closer to Mr Bayoh at this point.

15   PC Short is on the ground, as per his description.

16   In the inset we can see PC Tomlinson demonstrating

17   the stomp. Again, the snap that's been taken is at the

18   highest point at which the stomp would have occurred.

19   Again, as per all our other caveats, it's always best to

20   look at the actual full reconstruction.

21   Q.   And so the insert of the demonstration is just a moment

22   in time, but again, if the Chair wishes to consider the

23   actual demonstration itself in full you have given the

24   detailed location to find that footage at the bottom.

25   A.   That's correct.

1   Q.   And on the image on the right, again, Mr Bayoh is the

2   green character, PC Short is lying on the ground, and to

3   the right is PC Tomlinson.

4   A.   Yes.

5   Q.   Thank you. Let's look at C.8, please:

6   "PC Tomlinson describes moving towards and striking

7   Mr Bayoh."

8   Talk us through what we see here.

9   A.   So on the left-hand side you can see the bus stop to the

10   north of the image, or to the top of the image, and the

11   roundabout to the left of the image, position 1 being

12   PC Short's position on the ground, and position 3 being

13   PC Tomlinson's position. Position 4 shows PC Walker

14   moving towards Mr Bayoh.

15   Q.   Is that the direction of travel?

16   A.   Correct, yes. And then position 2 being where Mr Bayoh

17   and PC Walker landed. However, that's not reflected in

18   the image on the right-hand side yet, I don't think. So

19   on the image on the right-hand side we can see those

20   positions. There are two positions shown for

21   PC Tomlinson, so one to the side of the road and then

22   moving to his position where he is sort of face on to

23   Mr Bayoh, again, Mr Bayoh in green --

24   Q.   In the middle of the road?

25   A.   Yes, in the middle of the road. PC Short is shown on

1   the ground and then you have PC Walker coming from the

2   left-hand side. Again, you can see there's a note where

3   PC Walker doesn't specifically say "PC Tomlinson was in

4   this position", but he just knew that PC Tomlinson was

5   coming from a position to his left-hand side --

6   Q. PC Walker.

7   A. PC Walker, sorry, my apologies.

8   Q. No, no.

9   A. And he did that, again, using the line of sight image

10   and again, we've got a note in there just to say that

11   this is just to help him give his evidence, that the

12   view does not replicate human vision.

13   Q. So in the insert on the right-hand side is the green

14   figure, again, Mr Bayoh?

15   A. Yes.

16   Q. And on the left of that inset image, is that the arrival

17   of PC Walker?

18   A. Correct.

19   Q. And so it's indicative of the line of sight from

20   PC Tomlinson --

21   A. Yes.

22   Q. -- who is standing in the area.

23   A. And it's just to be aware that I believe that he

24   positioned PC Walker from that line of sight view as

25   well, so it's just to ensure that those caveats are in

1   place when looking at the head's position.

2   Q.   And again, the location of the actual evidence and the

3   footage of that evidence is given below.

4   A.   Yes.

5   Q.   And let's look at the final slide for PC Tomlinson, C.9,

6   slide 33:

7   "PC Tomlinson describes Mr Bayoh being taken to

8   ground."

9   Talk us through this slide.

10   A.   So pretty much the only figure we're looking at is (2),

11   it was referenced in the last slide as well, and it was

12   just the position where Mr Bayoh felt -- sorry, where

13   PC Tomlinson felt that Mr Bayoh had been taken to the

14   ground, effectively. You can see that on the right-hand

15   image where we're looking towards the roundabout, so the

16   roundabout is towards the top of the image, and the

17   position and orientation is by PC Tomlinson's

18   description.

19   Q.   Thank you. There's no attempt to do a 3D model of the

20   actual restraint itself?

21   A.   No. As per our initial discussions as to why -- the

22   reasons why we wouldn't do that.

23   Q.   And I think you also explained that in hearing 1 --

24   A.   Yes.

25   Q.   -- why that would not be possible.

1   A.   (Nods).

2   Q.   Thank you. Let's move on to the next series of slides.

3   There are four and these relate to Kevin Nelson and

4   these are images 34 to 37.

5   He gave evidence to the Chair on 31 May this year.

6   Can you talk us through D.1:

7   "Mr Nelson describes people's positions as police

8   arrive."

9   A.   So if we look at (a), which is the left-hand side image,

10   you can see the bus stop again to that right-hand side

11   of that image and the roundabout to the left, with

12   multiple circles and arrows. To go through those,

13   position 1 is Mr Bayoh's position as he was seen by

14   Mr Nelson. The arrow line 2 shows the direction of

15   Mr Bayoh's movement. Position 3 being a male officer

16   who came out of the driver's side of the vehicle.

17   Position 4 being Mr Bayoh's position when the male

18   officer was at position 3. The male officer -- the

19   arrow at 5 shows the movement of that male officer as he

20   moves back, and the position 6 shows the movement

21   slightly later where Mr Bayoh -- where he talks about

22   Mr Bayoh's movement after the male had discharged his

23   spray, or after a police officer had discharged his

24   spray.

25   On the right-hand side we see the first part of this

1   and literally the position of Mr Bayoh and the movement

2   of the officer as he moves down the path, so the blue

3   positions that you see on that right-hand side are the

4   same officer just moving back and retreating along

5   a pathway.

6   Q. And we heard from Mr Nelson he would not be able to

7   identify the individual officers --

8   A. Yes.

9   Q. -- other than identifying them as police officers, so

10   the labels that you have given to these blue characters

11   on the image on the right do not give names of officers?

12   A. No.

13   Q. And again, Mr Bayoh is green. You have said at the top

14   there:

15   "Officer height set to 1.73 metres - Average Male".

16   Explain why that is put in there?

17   A. For this particular slide because we don't know which

18   officer he was referring to and although I believe

19   PC Paton and PC Walker are of similar heights,

20   PC Tomlinson is not, so what we have done for those

21   positions is take an average male height of 1.73 just to

22   place into our scene as opposed to assume it's one or

23   the other.

24   Q. So you have not attempted to put your own subjective

25   view into these locations or into these characters at

 1   all?

 2 A. No, I think the only officer who we have given a height

 3   to I think is PC Short in the next slide, but that's

 4   because she was the only female officer on-site at that

 5   time.

 6 Q. Thank you. Can we move on to D.2, please -- sorry,

 7   D.1a.

 8 A. So in this image the reason we have only got one image

 9   is because I don't believe there's a reconstruction of

10   it. I believe that's because we didn't feel we could do

11   a decent reconstruction of this one event. However,

12   because it was captured in evidence we obviously want it

13   to be shown and brought to light, so Mr Nelson describes

14   the people positioned -- I believe this is obviously

15   after the fish van arrives, so he talks about a female

16   officer being position 1, Mr Bayoh's movement being the

17   arrow 2, and the male officer affected by the spray

18   after its discharge being 3.

19 Q. So again, if the Chair wishes to consider this in more

20   detail, he can look at the references on the previous

21   slide?

22 A. Yes.

23 Q. And then move on to D.2, please:

24   "Mr Nelson describes the location of the female

25   officer as she stumbled and fell."

1   Talk us through it.

2   A.   So on the left-hand side again it's the same image where

3   you can see the bus stop to the right-hand side and the

4   roundabout to the left. We can see positions 1 and 2

5   where position 1 is the position of the female officer

6   as she stumbles to the ground, and Mr Bayoh's position

7   is shown as position 2.

8   To the right-hand side you can see that we have

9   placed a character -- you can't quite see the text

10   because it's a bit far away, but that says "WPC", and

11   then you have Mr Bayoh standing -- or them facing each

12   other effectively. As you can --

13   Q.   So the WPC was the female officer?

14   A.   Correct.

15   Q.   Again, Mr Nelson wasn't able to provide names or

16   identifications.

17   A.   No, but in this instance because there's only one female

18   officer at the scene at this event we have given the

19   height of that person as PC Short's height --

20   Q.   Thank you.

21   A.   -- which I believe is 1.56, or 5-foot 1.5 in old

22   language.

23   On the inset you can see PC Nelson's description of

24   Mr Bayoh's movement --

25   Q.   Mr Nelson?

1   A.   Mr Nelson, I apologise.

2   Q.   Not at all.

3   A.   Mr Nelson's demonstration of Mr Bayoh's movement in the

4   scene.

5   Q.   Thank you. And again, a dynamic motion demonstrated but

6   the Chair can look at the actual footage.

7   A.   Correct.

8   Q.   On the right-hand image do we also see that there is

9   a Mr Nelson label that is attached to one of the windows

10   on the ground floor?

11   A.   Yes, so he was talking about the window that he was

12   looking out from which was his front living room window,

13   I believe, and we took an approximate viewpoint from

14   that view and that would be the character that we used

15   to take that viewpoint from.

16   Q.   So to assist the Chair you have added Mr Nelson on the

17   window location that he indicated in evidence he was at.

18   A.   Yes.

19   Q.   Thank you. And then can we look at D.2a slide, please,

20   which is the next slide, 37, and this is an image that

21   was prepared:

22   "Representation of line of sight from window of

23   Mr Nelson."

24   Tell us --

25   A.   So again, this is the line of sight from that orange

1   character as a viewpoint back into the scene of the 3D

2   view that he described.

3   Q.   So this is from the window that we noticed in the

4   previous slide --

5   A.   Yes.

6   Q.   -- on the ground floor of one of the houses and with the

7   female officer you have marked WPC, you have used the

8   height of PC Short --

9   A.   Yes.

10   Q.   -- for the purposes of this image?

11   A.   Yes.

12   Q.   And this was an image prepared -- a refined image after

13   the input of Mr Nelson.

14   A.   Yes.

15   Q.   Thank you. Thank you very much.

16   A.   Just to add to that though, this image was shown to

17   Mr Nelson and he did indicate that it was representative

18   of his view.

19   Q.   Thank you. Let's move on now to the final images, so

20   images 38 to 41. Again, we've got four images here, and

21   this relates to former Police Constable Paton. E.1:

22   "PC Paton describes Mr Bayoh's position as the van

23   arrives."

24   Tell us what we see here?

25   A.   So as previously said, we didn't do steps 2 and 3 with

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 1          PC Paton so it's only step 1 and he --

 2      Q.  And step 1 is the image of Hayfield Road where he

 3          independently applied the red circles?

 4      A.  Correct, to the still images.

 5      Q.  Thank you.

 6      A.  So position 1 is Mr Bayoh's position when PC Paton first

 7          saw him; 2 indicates the direction that Mr Bayoh was

 8          walking; 3 is the position -- Mr Bayoh's position when

 9          the Transit van had arrived and stopped, and the fourth

10          one is basically a repeat of the third one, I believe he

11          did like a double tap or something to reflect that, so

12          fourth is effectively an error.  So this occurs as

13          the police van arrives which is why the scene is bare

14          and there are no vehicles within that scene --

15      Q.  Thank you.

16      A.  -- or no police vehicles within that scene.

17      Q.  Again, for the benefit of the Chair, you have identified

18          the locations of the footage at the bottom.

19      A.  Yes.

20      Q.  And then can we look at the next slide please, E.2:

21              "PC Paton describes the location of people after

22          leaving the van."

23              Talk us through this.

24      A.  So we're looking at another still image.  You've got the

25          bus stop to the right-hand side and the roundabout -- or
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 1          the line-work to the roundabout on the left-hand side.

 2          So position 1 is PC Paton's position when he discharges

 3          the spray, with position 2 being Mr Bayoh's position.

 4          Position 3 is the position that PC Paton moved to when

 5          he goes to the back of the van and he describes this

 6          sort of curling up, or sort of bending over.  Circle 4

 7          is PC Walker's position before the spray affected

 8          PC Paton's eyes, and then 5 is PC Short's position on

 9          the ground.

10     Q.   Right.  And again, you have given us the footage which

11          was given -- the evidence given on 21 June --

12     A.   Correct.

13     Q.   -- or played to the Inquiry on 21 June and it's an hour

14          and 12 minutes into that footage.

15     A.   Just as a reminder that I wasn't present for PC Paton's

16          evidence, it was something that I reviewed through the

17          YouTube videos that are captured in the Inquiry system.

18     Q.   So you have reviewed it, but you have not then attempted

19          to prepare the refined slides --

20     A.   Correct.

21     Q.   -- because you didn't have the benefit of discussing

22          that with the witness in real time?

23     A.   Yes, correct.

24     Q.   And then I think there was another slide 42 but that's

25          blank, I think, if that's not been removed.
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1   A.   Just this one. Have you seen this one?

2   Q.   Sorry, a slight error there. Let's look at E.3 then:

3   "PC Paton describes the location of the restraint."

4   Talk us through this?

5   A.   So basically, as with other witnesses, PC Paton was

6   given the opportunity to select a point on the screen

7   where he felt the restraint took place and that's just

8   demonstrated by circle 2 on the screen.

9   Q.   Thank you. I think that is the final slide, so let's

10   just check -- yes, so that's -- I would like to move on

11   briefly just to discuss something else that you have

12   subsequently provided to us, Mr DeGiovanni. If we could

13   look briefly at SBPI00187.

14   Now, after you gave your evidence and your first

15   report was disclosed I think we received some queries

16   where we asked you for further detail to be provided.

17   A.   Yes.

18   Q.   And you kindly were -- you were sent what we call

19   a Rule 8 request and you prepared a response to those

20   further queries for the benefit of the Chair.

21   A.   Correct.

22   Q.   And if we look at the document on the screen at the

23   moment you should see what's called a Rule 8 statement

24   from yourself which is the response that was prepared to

25   the questions asked.

1   A.   Yes.

2   Q.   And this should be 12 pages. I think you will have

3   a hard copy in the folder.

4   A.   I have one here.

5   Q.   Great, thank you. So 12 pages and can you confirm that

6   this was signed by you on every page on 17 November this

7   year?

8   A.   Yes, using digital systems.

9   Q.   Yes. And at the end of this -- if we can go to the very

10   final page, please. We will see a paragraph that says:

11   "I believe the facts stated in this witness

12   statement are true. I understand that this statement

13   may form part of the evidence before the Inquiry and be

14   published on the Inquiry's website."

15   A.   Yes.

16   Q.   And that was your understanding?

17   A.   Correct.

18   Q.   And just so you're clear that in fact this will be

19   published on the website after the conclusion of your

20   evidence.

21   A.   Okay.

22   Q.   Thank you. I don't want to go through every line,

23   obviously this is available for the Chair's

24   consideration, but there are one or two things that

25   I would quite like to be clear about.

 1   Can we look, first of all, at question 2 on page 1,

 2   and you were asked to clarify what original material did

 3   Advanced Laser Imaging rely on in its work, and could

 4   you please explain to us what original material you did

 5   rely on?

 6   A.   So when we were first instructed we were basically given

 7   access to a huge amount of material, some several

 8   hundred different documents or videos or images and it

 9   was really -- there was no real continuity chain or date

10   of submissions for each of these, so what we couldn't do

11   when we were looking at this is just by looking at the

12   numbers or looking at the references understand which

13   bits of evidence were original material and which ones

14   weren't. What we had to do is piece by piece look at

15   every single piece of evidence and try and understand

16   which one was most likely to be the original source of

17   material and this was done by looking at metadata within

18   video files or audio files and trying to work back to

19   understanding where, for example, compilations had been

20   created from and the root of the evidence and that had

21   all been done. I talk about it as being effectively

22   a black box exercise, where we tried to use --

23   Q.   What does that mean?

24   A.   It basically means where we don't have other information

25   to rely on, so we're trying to understand which

1   information is original and which is a derivative of the

2   core material based on viewing elements of the file

3   itself, as I say, including metadata within the file, or

4   the make-up of the file itself, so, for example, on the

5   videos we would be looking at the compression type,

6   pixel sizes, resolutions, compression ratios, things

7   like that, to try and understand which was the original

8   material and where possible we would then use that

9   material.

10   Q.   So you did your own assessment of the material you were

11   sent by the Inquiry to do your best to try and work out

12   which was the original?

13   A.   Correct.

14   Q.   Right. In fact, as I understand it, one of those

15   elements was the CCTV from Gallaghers pub.

16   A.   Yes.

17   Q.   And you have now been sent the original CCTV and you

18   have had the chance to review it.

19   A.   Yes.

20   Q.   And can you tell us -- we could maybe look at

21   question 14 which may assist. We were asked if the

22   original -- if PIRC 01287 -- we don't need to look at

23   that -- was the original footage from the pub and if

24   not, did this have an impact on your work. Could you

25   explain to the Chair the position regarding the original

 1   footage?

 2   A. Yes, so I have now had a chance to review what I believe

 3   is the original material and I have done a side-by-side

 4   comparison and I believe that PIRC 01287 that we

 5   received was effectively a copy of the original. It was

 6   in the same compression format, it was a same

 7   resolution, same frame rate, and when you do

 8   a comparison of two of the frames, they were identical,

 9   so it led me to believe that PIRC 01287 was indeed

10   a copy of an original and as close an original as we

11   had. Basically it is -- it's a digital copy of the

12   original file.

13   Q. And just to be clear for those listening, you have not

14   been asked -- it's not part of your role to try and

15   enhance that CCTV or to provide further clarity. That

16   would be for another type of expert.

17   A. Correct. There is a limited work that we would do, but

18   it isn't our core expertise so we wouldn't stray into

19   that.

20   Q. So that would be for someone else to discuss.

21   A. Correct.

22   Q. We will perhaps hear evidence about this later.

23   Thank you.

24   But nothing you have said would alter, as far as

25   I understand, that it will be for the Chair to view that

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 1              CCTV himself and to form his own views about what can be

 2              seen on that CCTV.

 3       A.     Yes.

 4       Q.     Thank you.  Can we move on to question 27.  You will see

 5              that the actual heading is "ARLS", that's at the bottom

 6              of page 5, and then the question is given at the top of

 7              page 6 of your Rule 8 response -- sorry, yes, question

 8              27:

 9                  "In what way were the documents listed from

10              PIRC-03527 -- COPFS-00170 (inclusive) on page 71 of

11              [your] first report used in creation of the digital

12              reconstruction?"

13                  And the answer is that:

14                  "ALI used [those documents listed] in reconstructing

15              the ARLS tile in the Evidence Video Timeline."

16                  Now, just to remind ourselves, that's the tile that

17              we can see on the evidence video timeline at the top

18              right-hand corner of the screen?

19       A.     That's correct, yes.

20       Q.     And that's in relation to the location of vehicles and

21              a GPS tracker?

22       A.     Yes, so on the radios, the handheld radios that the

23              police officers had and in the vehicles, they have

24              Airwave radio, but part of that is the ability to

25              capture and transmit GPS information which again --
```

1   which gets stored onto the ARLS system.

2   What we had here in terms of PIRC 03527 through to

3   PIRC 03543 is a series of tables or CSV files and it

4   contained technical data about the location and the

5   timing of those GPS signals, so the -- those core CSV

6   files were what we used to be able to position vehicles

7   at specific times within that ARLS tile in the video

8   evidence timeline.

9   Q.   Now, I think from memory you gave quite a detailed

10   passage of your evidence about this work that you did in

11   hearing 1.

12   A.   Yes.

13   Q.   And that's still available to the Chair to consider.

14   I didn't ask really many witnesses about this data, but

15   I understand from your first evidence that not all the

16   GPS signals were working on 3 May, is that right?

17   A.   Correct. Several of the vehicles, the GPS unit -- they

18   didn't store any information for it. In combination

19   with that, some of the personal radios, there was no

20   data at the start of the event and so I think in my

21   original testimony I stated that it isn't a complete

22   picture that ARLS can give you, but it does give you

23   what's available, which is the purpose of the evidence

24   video timeline.

25   Q.   Thank you. And that evidence that you gave at hearing 1

 1   is still available in its entirety. You did explain the

 2   position that some of that data wasn't available to you.

 3   A.   Yes.

 4   Q.   Thank you. Well, I would like to move on to page 7 and

 5   question 29. We see that this question is:

 6   "What is a re-encoding error? Is there potential

 7   that any re-encoding process will introduce errors?

 8   What impact, if any, might such errors have on the

 9   Evidence Video Timeline and the Chair's reliance on

10   same?"

11   And then if we move on to the next page, at page 8,

12   the final paragraph of that says:

13   "As the re-encoding errors are not perceivable under

14   normal viewing and all timings have been checked, ALI

15   does not believe that this impacts on the Evidence Video

16   Timeline. This being said, it would be prudent in

17   making interpretation from a specific CCTV tile in the

18   Evidence Video Timeline that the same interpretation can

19   be made in the original CCTV video."

20   A.   Yes, that's correct.

21   Q.   So to help the Chair understand, you would always

22   recommend that he consider the original but you don't

23   believe that the re-encoding error has an impact on what

24   can be seen on the evidence video timeline?

25   A.   Yes, correct.

 1   Q.   Do you have anything else to add about that? Anything

 2   the Chair should know or ...?

 3   A.   I think it's just to bear in mind that in the evidence

 4   video timeline we used the redacted versions of the

 5   videos that were available so these don't always

 6   necessarily relate back to the original CCTV, but they

 7   will be effectively the redacted versions of -- that

 8   were produced to be shown in these hearings.

 9   Q.   So that's another factor that the Chair might have to

10   consider?

11   A.   I believe so, so even though the processes that we did

12   didn't bring in any perceivable changes to the evidence,

13   it doesn't mean that potentially there haven't been some

14   that have been added previous to us using them.

15   Q.   For example, Mr DeGiovanni, do we -- you may recollect

16   that when we listened to and watched the evidence video

17   timeline, sometimes Airwaves transmissions had areas

18   blanked out or obliterated --

19   A.   Yes.

20   Q.   -- because it contained personal data of people calling

21   the 999, calling the police, so the Chair would have to

22   be aware that that may not be exactly as the original,

23   but there may be redactions applied --

24   A.   That's correct.

25   Q.   -- for other purposes. Thank you.

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 1              Then I would like to turn to -- it's question 32 on

 2         page 9.  This says:

 3              "Can ALI provide further details in relation to the

 4         steps taken to validate the photogrammetry used in

 5         creation of the digital reconstruction tile within the

 6         Evidence Video Timeline?"

 7              And you have given some quite detailed information

 8         here and you have said:

 9              "In the case of digital single image oblique

10         photogrammetry the following are considered to have the

11         greatest effect on error."

12              I'm not sure I'm saying this correctly:

13              "Photogrammetric Error Propagation."

14    A.   Correct.

15    Q.   Is that a reasonable indication?

16    A.   Yes, that's spot on.

17    Q.   And:

18              "Lens distortion."

19              And you have given quite detailed information about

20         this.  I'm particularly interested in page 11 of this

21         answer, and this relates to figure A.2:

22              "Variation of measurement of objects within the

23         scene."

24              And you have given a table which talks about an

25         object -- if we can go down slightly.  Page 11, sorry.
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1   We see the images and then we see the table. If we can

2   go back to the images perhaps for a moment and I wonder

3   if you can help the Chair understand about the variation

4   of measurements of objects within a scene.

5   A.   Yes. So after we have conducted this photogrammetric

6   process and we have -- I have described in both sessions

7   now how we do that and effectively we're looking at

8   contact points with the ground, so the best way for us

9   to determine the accuracy of a photogrammetric solution

10   is to try and take measurements of fixed objects or

11   known objects within the scene and then compare those

12   back to the laser scan data which is the ground truth or

13   the actual position, so what we have done in the near

14   range, or at the roundabout is we have taken, for

15   example, the centre circle of the roundabout as being

16   a fixed object that we can measure to, and one of the

17   lines running away from -- line markings -- away from --

18   towards the side of that roundabout.

19   And what we have done is we have used the

20   photogrammetric system to try and take a measurement and

21   then we have compared that to the actual position within

22   the 3D laser scan data. The difference between the two

23   tells us the accuracy of the solution.

24   Now, as I have mentioned before, after we have

25   removed or mostly removed the lens distortion, we're

1   left with the propagation error which basically talks

2   about the error of the solution as we go with distance,

3   so the further away we move from the camera and the

4   further we take measurements, the larger and the greater

5   the error that we would get, so we have looked at the --

6   I will call it the near position, even though it is

7   quite far away from the camera already, which is the

8   line markings, but we wanted to understand the errors

9   further than that by going back into the field of view

10   even further.

11   Because of the quality of the footage we can't pick

12   up line-work, we haven't got specific objects that we

13   can identify that are fixed within the scene, so in this

14   case what we had to use is dynamic objects and for that

15   we have used parked vehicles that the police parked in

16   the scene as they were dealing with the incident.

17   The reason we are able to identify those positions

18   is because we have much better footage from

19   Ashley Wyse's camera of those locations, so we can be

20   much more confident about their location from that

21   footage and we can use that as our assessment or

22   understanding of error in the far plane, and that's

23   effectively what you can see in (c) and (d), or the

24   lower end of that image on your screen.

25   What that effectively means is, as you said

1   previously, the further we move into this scene, the

2   greater the error on positioning people would occur to

3   the point that at the furthest distance -- and we're

4   talking roughly 100 metres away from the camera -- we

5   would be talking about an error of between 3 and

6   4 metres on any individual measurement. It's why in the

7   initial assessment, or the initial interview -- my

8   initial session I have said that really when we're

9   looking at that positioning tile, especially from the

10   work we have done from Gallaghers footage, we should

11   really be considering that as indicative and not be

12   using it to try and assess in great detail exactly where

13   people were, but just to understand the locations of

14   people at specific times.

15   Q.   So let me just take you through that a little more

16   slowly. This is in relation to the digital

17   reconstruction tile that is on the evidence video

18   timeline in the top middle of the screen.

19   A.   That's correct.

20   Q.   And photogrammetry is one of the crosschecks that you

21   can carry out to confirm that the positioning of

22   vehicles or buildings is accurate?

23   A.   So it's when we have positioned people or vehicles

24   within a scene. It's to understand by how much of

25   a tolerance we fitted that person or being able to put

1   that person into the scene, so it's how well we can

2   position someone within that scene.

3   Q.   And that can be carried out with things like CCTV

4   footage?

5   A.   Yes.

6   Q.   And that's used, but the further away from the camera,

7   the less accurate you can be in terms of positioning --

8   A.   Correct.

9   Q.   -- using that tool of photogrammetry?

10   A.   Correct.

11   Q.   But in this particular situation, as I understand it,

12   you have also got not just the photogrammetry, but

13   you've got the laser scan data from 2015?

14   A.   Yes.

15   Q.   And you've got the Snapchat footage from Ashley Wyse's

16   mobile phone.

17   A.   Yes.

18   Q.   And you've also had those to rely on, and not just the

19   CCTV, to position vehicles --

20   A.   Correct, yes.

21   Q.   -- and other things in the scene.

22   A.   Yes, but for people positions we had to rely on

23   Gallaghers' footage because it was the only complete

24   source of CCTV covering the events.

25   Q.   But in addition, for the benefit of the Chair, he can

1   always go back to the individual eye-witness evidence

2   from the witnesses that we have heard.

3   A.   I don't believe that one piece of evidence should be

4   taken in isolation. It's all got to be considered

5   together.

6   Q.   And so although there is this margin of error, which

7   I think quite rightly you spoke about in hearing 1, the

8   Chair should consider all the evidence available to him

9   from all the sources and not just this one element.

10   A.   That's correct.

11   MS GRAHAME: Thank you. Could you just give me one moment

12   please?

13   (Pause)

14   Thank you very much, I have no further questions.

15   LORD BRACADALE: Thank you.

16   Are there any Rule 9 applications at this stage?

17   No.

18   Well, Mr DeGiovanni, thank you very much for coming

19   back to give evidence again and also for all the work

20   that you and your team have done for the Inquiry.

21   I think that by using the range of products that you

22   have developed we will all gain a clearer understanding

23   of the evidence, so I'm very grateful to you for your

24   input.

25   That completes the evidence mean time and the

1   Inquiry will now adjourn.

2   (12.51 pm)

3   (The Inquiry adjourned)

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