

## 5G on the Elizabeth line

It is often hard to explain the intricacies of delivery in the limited space a press release allows and so the approach to delivering 5G on the Elizabeth line may not be completely explained by our external communications. This note is designed to more clearly explain our approach. The end goal is to have 4G and 5G deployed fully in both stations and tunnels on the Elizabeth line. In the short term to facilitate early delivery we will initially deploy 4G in the stations and 4G and 5G in the tunnels – this will be subject to further testing in both stations and tunnels. Tunnel testing has yet to be completed, although we don't anticipate any issues from the intermodulation studies that we have already completed. We obviously take the testing aspect of delivery very seriously. The tunnel 5G coverage will inevitably also leak into the station to provide some coverage there too.

For efficiency sake, as far as possible, we are using the already installed infrastructure to provide cellular coverage. We are also using the maximum number of frequencies to help the Mobile Network Operators (MNOs) provide the best possible service. For the tunnels we are only using the existing antenna system (leaky feeders in the tunnels). The rest of the infrastructure is new build and therefore we are using the same approach as we are for the London Underground. This allows us to provide the same service as with the London Underground with both 4G and 5G available.

In the stations we are also initially using the existing station antenna system. It differs slightly for the two types of station, in LU managed stations the infrastructure is shared with all other systems, whereas in RFLI managed stations there are two antenna systems with a slightly different configuration of systems deployed. We repeat the testing on each. However, the major obstacle is that the existing infrastructure does not support the higher frequencies that the MNOs require for their 5G coverage. This is the reason that we are not initially deploying 5G in the stations. To overcome this issue, we would need to install the same small-form low power radios that we have installed in the LU stations. Although this seems straightforward the design of the Elizabeth line stations makes running cables difficult. In the light of this challenge, we decided that early coverage with 4G was a sensible way forward with a longer term aspiration to install the 5G radios at a later date. We will rerun the testing before these new radios are turned on during passenger hours of course.

Hopefully this provides a clearer picture of the 4G and 5G rollout with the station and tunnels of the Elizabeth line. If you have further questions please let me know.