Google’s own code may explain why the Pixel 4’s Smooth Display isn’t always as smooth as you’d like

Google apparently won’t let Google Maps, Pokemon Go, Waze, and WeChat use the Pixel 4’s “Smooth Display” feature to run at 90Hz, according to an explicit blacklist that *XDA Developers’* Mishaal Rahman and *9to5Google* found in apparent source code for the Pixel 4 and Pixel 4 XL.

We haven’t yet been able to test ourselves if these apps are unable to run at 90Hz, but *Android Police* confirmed that Google Maps and Waze only ran at 60Hz on its Pixel 4.

For Google Maps, Pokémon Go, and Waze, it’s not too surprising that Google may have locked them to a more standard 60Hz. All of those apps are already big battery drainers, since they simultaneously use your phone’s GPS, cellular radio, GPU, *and* keep the screen on for long periods of time. Running at 90Hz would, in theory, suck up battery even faster. (And Niantic apparently capped Pokémon Go at 30 fps earlier this year, anyway.)

Maybe someday Google will let these apps run at 90Hz
It doesn’t make as much sense why WeChat might not be allowed to run at 90Hz, but Google’s source code for the Pixel 4 apparently says that the app has “poor performance” at the higher refresh rate.

Smooth Display hasn’t gone over as smoothly as Google may have hoped. Earlier this week, some Redditors figured out that the

Pixel 4’s refresh rate falls to 60Hz if its screen is at 75 percent brightness or lower. Google told us that upcoming software updates will enable 90Hz “in more brightness conditions,” so in the future, you might be able to use Smooth Display when the screen isn’t as bright.

We may now know why Google disabled 90Hz at lower brightness, by the way: commits found in Android 10’s source code by *XDA Developers* say it’s because you would have seen the screen flicker as the refresh rate changes. Here’s a more technical explanation from one of the commits:

> *The display uses different gamma curves for different refresh rates. It’s hard for panel vendor to tune the curves to have exact same brightness for different refresh rate. So flicker could be observed at switch time. The issue is worse at the gamma lower end. In addition, human eyes are more sensitive to the flicker at darker environment. To prevent flicker, we only support higher refresh rates if the display brightness is above a threshold. And the darker environment could have higher threshold.*

Let’s hope that Google follows through with its software updates and finds a way to let you use Smooth Display at lower brightness levels — and, maybe someday, let the apps that are apparently locked at 60Hz take full advantage of the 90Hz screen in a battery-friendly way.

https://www.theverge.com/2019/10/25/20932437/google-pixel-4-smooth-display-screen-google-maps-waze-pokemon-go-wechat-90hz-60hz