

# **“Display Cutout Device Development Guideline”**



Last updated: Mar 21, 2018

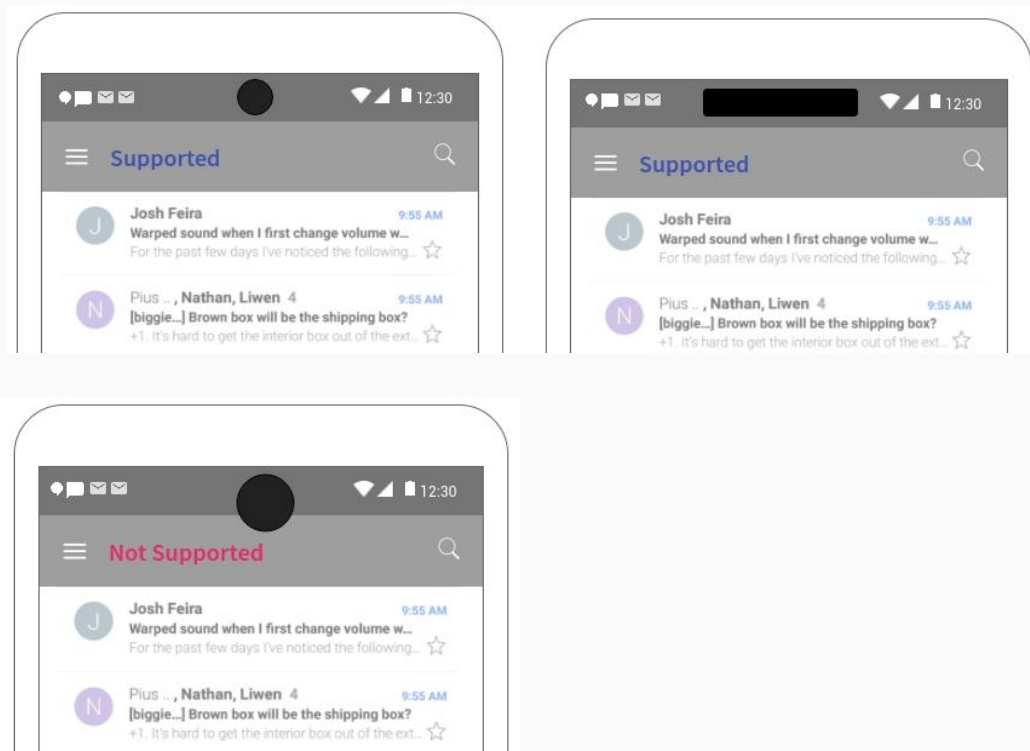


# Release Notes

Release date	Version	Release Note
2017-11-29	1.0	<b>Initial Release</b>
2018-01-16	2.0 (latest)	<b>Revised to reflect P feature design direction and relax the requirements for 1P apps</b> 1) Status bar requirement changes - Status bar must be at least as tall as the cutout height (in previous version, it must be taller than the cutout height) <b>(revised)</b> - Minimum width of icon area (App notification & System status) has been changed from 110 dp to 95 dp <b>(revised)</b>  2) App Display - Portrait (UI_FLAG_FULLSCREEN) : 1P App can be drawn in top notch area <b>(new)</b> - Landscape : 1P App can be drawn in notch area <b>(new)</b> - Designed behavior in P <b>(new)</b>  3) Consideration - Mismatch of touch coordinates and view coordinates <b>(new)</b>
2018-03-08	3.0 (latest)	1) Term changed from Camera notch to Display Cutout <b>(new)</b> 2) Partner feature flag added for tracking <b>(new)</b> 3) Supporting layout has been changed from Horizontally centered cutout to Display cutout on top side <b>(revised)</b> 4) P API changes <b>(revised)</b>

# Supporting Layout

- **Supporting**
  - **Display cutout on top side** meeting status bar requirements defined later in this slides.
  - **Dual display cutout** with one in each shorter side of the device (one on top, one on bottom)
- **Not Supporting**
  - Display cutout **taller than Status bar height** due to App compatibility



# Status Bar Requirements

- **Height**

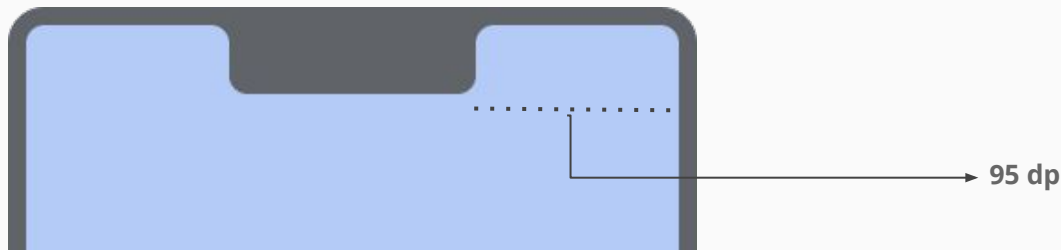
- **Min. height - 24 dp**
- Height can be adjusted in accordance with display cutout height
- Status bar **MUST be at least as tall as the cutout height**. The recommended height is the height of the cutout, but it can be taller if needed.
- No need to get synced with the height of Nav bar

- **Width**

- **min. width** of icon area (App notification & System status) - **95 dp each** (*contact to your TAM if your device doesn't meet this*)

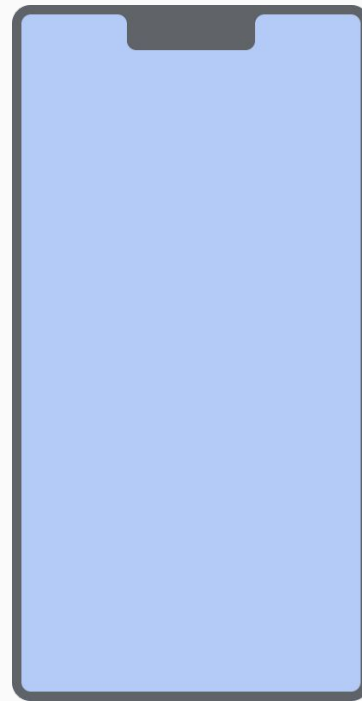
- **Status bar adjustment**

- Some of status bar behavior such as icon alignment, etc **can be adjusted**
- **Strongly recommend** to have, at least, Battery, Network & WiFi strength icons on the system status icon area in case of wider display cutout

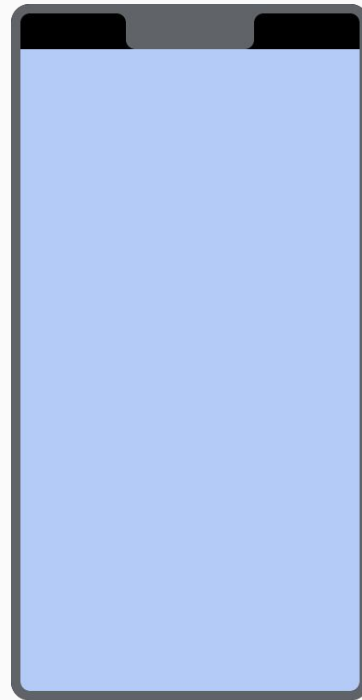


# App Full & Immersive Screen Mode (SYSTEM\_UI\_FLAG\_LAYOUT\_FULLSCREEN)

- **App display**
  - 1P & 3P App - Apps MUST be drawn in top display cutout area
  - **Almost all non-game apps**
- **Consideration**
  - In case of long display device with no resizableActivity & maxAspect, **screen aspect ratio** should be considered such as **letterboxing the app** (*Only applicable target SDK is 25 or lower*)
  - App **must not** stretch out to cutout area when the app is displayed in split window



SYSTEM\_UI\_FLAG\_LAYOUT\_FULLSCREEN



No resizableActivity/max\_aspect

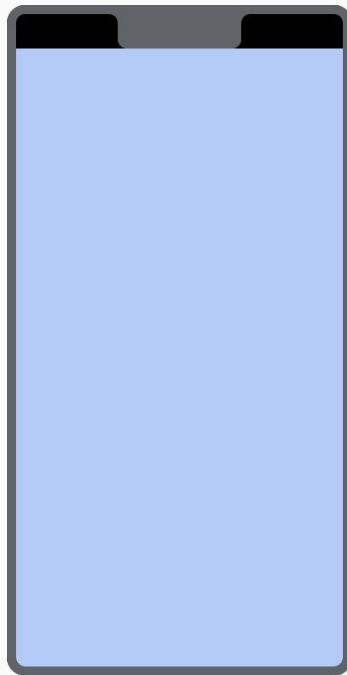
# App Full & Immersive Screen Mode (UI\_FLAG\_FULLSCREEN)

- **App display**

- Display cutout must not overlap App UI & contents
  - 1P App - App **can** be drawn in **display cutout area**. However, important contents and/or interactive UI must not be overlapped by cutout.
  - 3P App - App **must** be letterboxed to keep the cutout out of the app's display.
- **Game**, e-Book reader, etc

- **Consideration**

- **App must be letterboxed** to keep the cutout out of the app's display



3P App - Letterboxing App

# App Full & Immersive Screen Mode ( Landscape)

- **App display**

- Display cutout **must not overlap App UI** & contents
  - 1P App - App **can** be drawn in **cutout area**. However, important contents and/or interactive UI must not be overlapped by notch.
  - 3P App - App **must** be letterboxed to keep the cutout out of the app's display

- **Consideration**

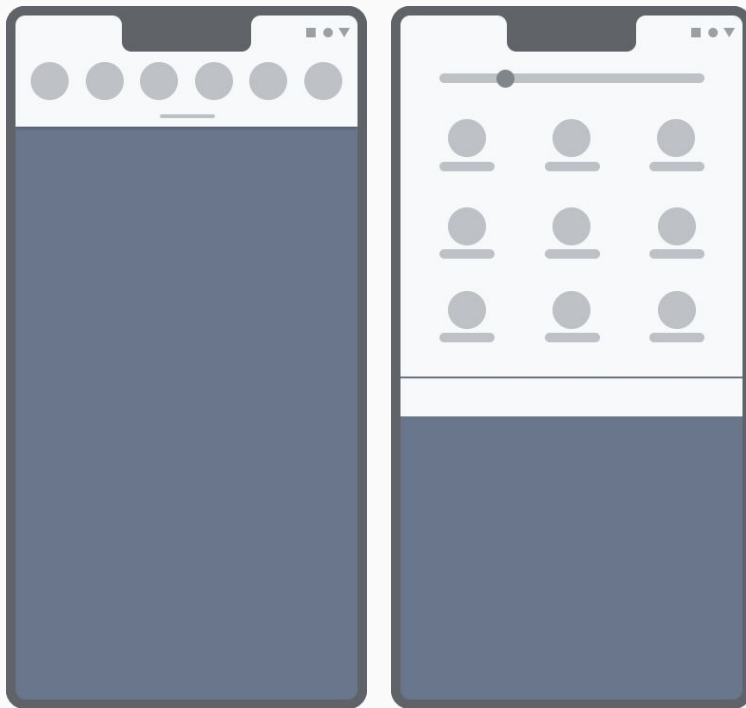
- App **must not** stretch out to cutout area when the app is displayed in split window



3P App - Letterboxing App

# Notification & Setting UI

- **Heads up notification**
  - Display cutout **must not overlap notification UI** & contents
- **Quick setting**
  - Display cutout **must not overlap the quick setting UI nor menu icons** (user, edit, setting, up/down arrow).





# Display Cutout Device Tracking

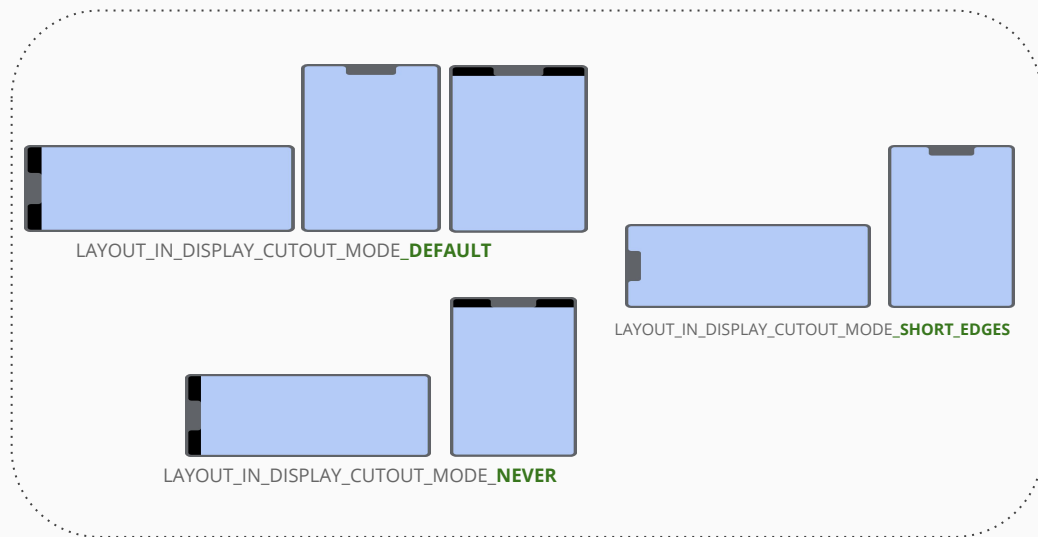
- OEMs releasing display cutout must have partner feature flag following the name convention.
  - **com.[partner].hardware.display.camera\_notch**
  - Note : the flag type MUST be use **"type": "other"** rather than sdk type.
- Up to 8.1, API level 27 Android doesn't support display cutout. Display cutout device in pre-P is type of \*special\* device, there has to be a **consistent way to identify such devices** to be future proof and **issue management** whenever necessary

# Consideration & Resource

- Apps **not properly factoring WindowInsets**
  - Using **status bar height** instead of WindowInsets & fitsSystemWindows
  - Using **hard-coded/wrong Status bar height (24dp)** such
- **Screen Aspect ratio - Meet it otherwise you'll fail** to get build approval. **No relationship with this** but there are cases you should consider it more carefully *due to display cutout*
- **Mismatch of touch coordinates and view coordinates** - Some of Apps such as Youtube, Instagram, Stringify, etc could be broken in case **Apps are letterboxed in SYSTEM\_UI\_FLAG\_FULLSCREEN**



# Forward Compatibility - Designed behavior in P



```
class WindowInsets {  
    DisplayCutout getDisplayCutout();  
}  
  
class DisplayCutout {  
    int getSafeInsetLeft();  
    int getSafeInsetTop();  
    int getSafeInsetRight();  
    int getSafeInsetBottom();  
    List<Rect> getBoundingRects();  
}  
  
class WindowManager.LayoutParams {  
    int layoutInDisplayCutoutMode;  
  
    final int .._MODE_DEFAULT;  
    final int .._MODE_SHORT_EDGES;  
    final int .._MODE_NEVER;  
}
```

Thank you!

Questions?

