

Responsive Design Breakpoints

How do screen resolution, viewport and mobile device sizes affect the way we design Refinitiv Workspace apps?

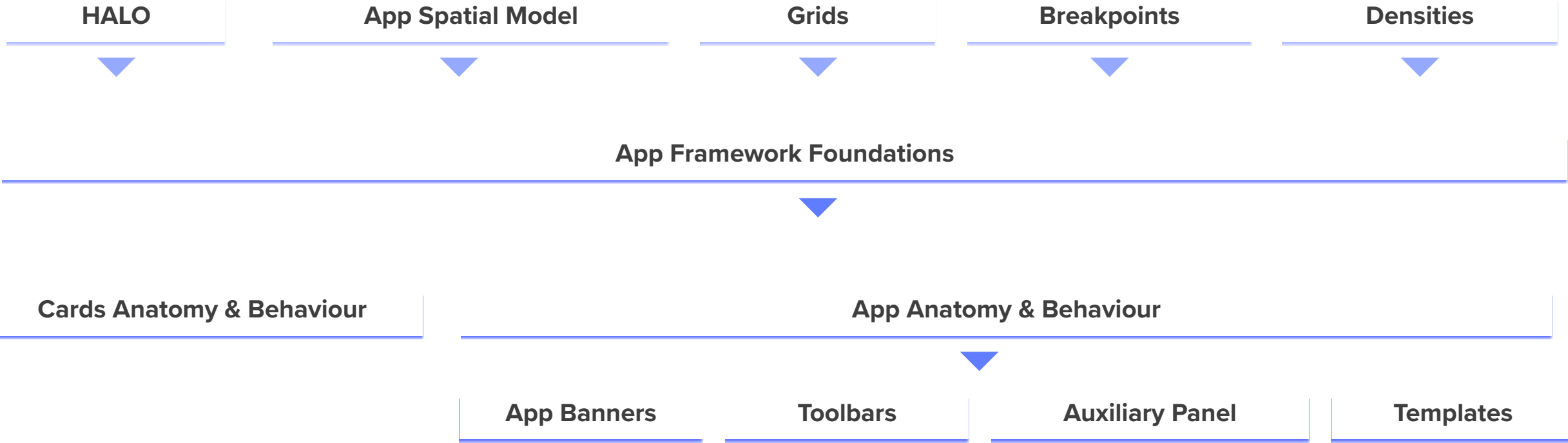
App Framework Team

Yooch Wan

June 2020



App Framework Foundations



Breakpoints in Responsive Design

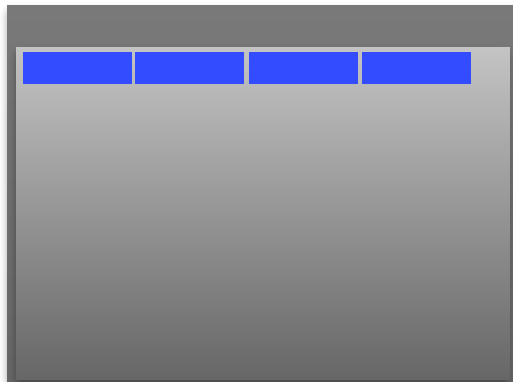
What is a breakpoint?

“In responsive design, a breakpoint is the “point” at which a website’s content and design will adapt in a certain way in order to provide the best possible user experience.”

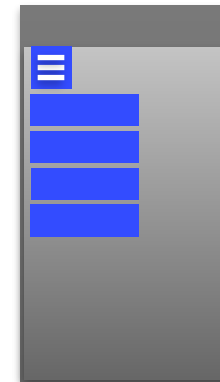
<https://www.browserstack.com/guide/responsive-design-breakpoints>

For example, when a website is viewed on a regular desktop screen, the user sees the whole navigation menu as tabs across the page. However, if it is viewed on a mobile device screen, the smaller screen size will cause the navigation bar to disappear and instead display a hamburger menu from which the hidden navigational items can be accessed.

Desktop App Viewport



Mobile Viewport



Viewports

What is a viewport?

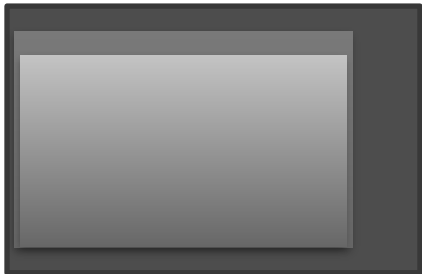
“the visible area of a webpage on a display device”.

<https://www.techopedia.com/definition/32644/viewport>

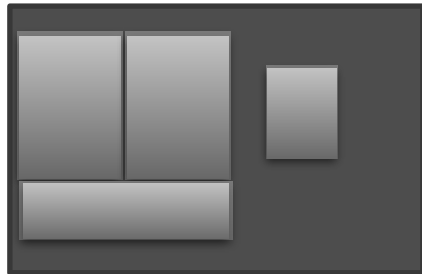
“A viewport represents a [...] rectangular area [...] that is currently being viewed. In web browser terms, it refers to the **part of the document you're viewing which is currently visible in its window [...]** Content outside the viewport is not visible onscreen until scrolled into view”.

<https://developer.mozilla.org/en-US/docs/Glossary/viewport>

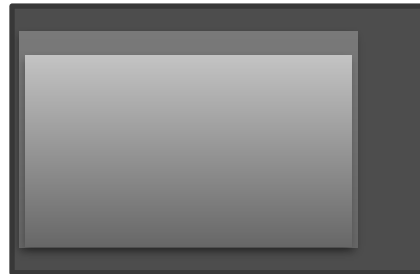
Desktop App Viewport



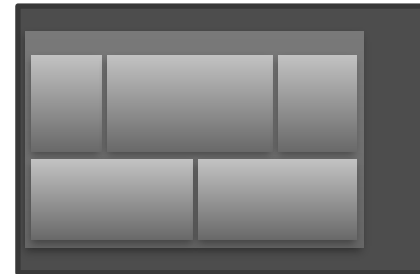
Desktop Tile Viewport



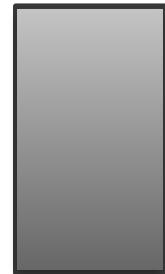
Web App Viewport



Viewports within Layouts



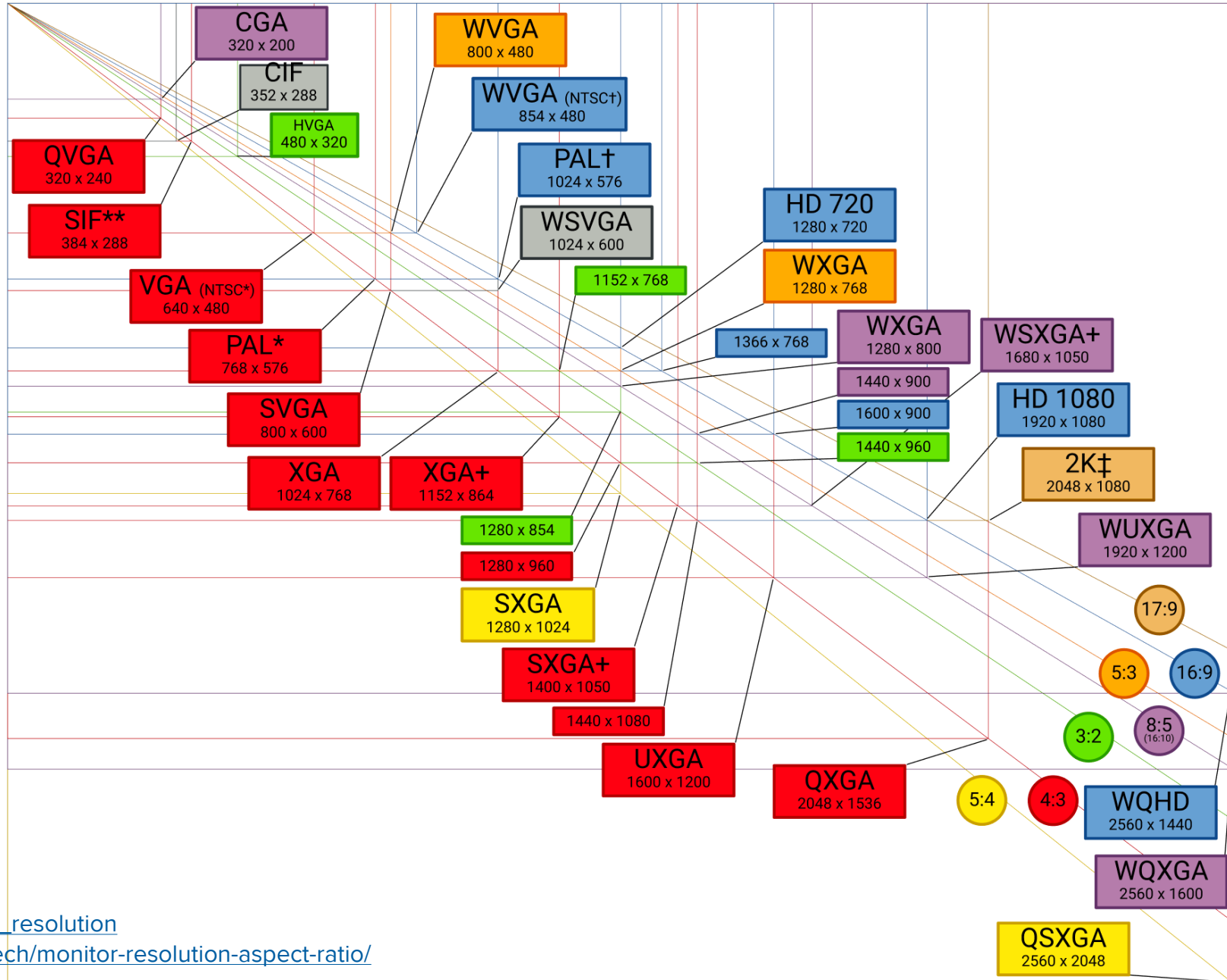
Mobile Viewports



Screen Resolutions

Laptop and Desktops considerations

Screen Resolutions



https://en.wikipedia.org/wiki/Display_resolution

<https://www.viewsonic.com/library/tech/monitor-resolution-aspect-ratio/>

Users' Screen Resolutions

Log Analysis

- **Period: 24-May-2020 - 09-Jun-2020 (~ 2 week period)**
- **126,215 instances of logged-in users** (there are duplicates)
- **Logs capture how many screens a user is using but only the screen resolutions for the first three screens**
- **Desktop & Laptop screen sizes only**
- **Some user sessions do not register a primary display but secondary**

Timestamp	MachineID	InstallationID	UserID	UserName	First Name	Last Name	Host Name	AccountName	AccountID	Region	Country	Screen #1 Reso	Screen #2 Reso	Screen #3 Reso	No. of Screen	Total Screen Resolution
08/06/2020 11:52	7e8961be-64fac47a2c-65a	GEPTC-10621	Andy Evans	Andy Evans			LON-ME0814	Schroder Inve	SL1-86C	emea	United Kingdc	1920 x 1080	1920 x 1080		2	3840 x 1080
08/06/2020 06:35	d4d252e7-825b46790b-5a	GEPTC-10621						Zwickauer En	76	emea	Germany	1920 x 1200			1	1920 x 1200
05/06/2020 11:31	4c4c4544-0c2f3f4d94-59f	GEPTC-10621					D-3000	Corion Capita	Q71	emea	South Africa		1920 x 1080			
08/06/2020 10:52	4c4c4544-0c2f3f4d94-59f	GEPTC-10621					D-3000	Corion Capita	Q71	emea	South Africa	1920 x 1080			1	1920 x 1080
29/05/2020 12:07	4c4c4544-0c9da9c9b1-ee	GEPTC-10621					J-0000	Jamieson Cor	J0-3	emea	United Kingdc	1920 x 1080			1	1920 x 1080
08/06/2020 10:49	30d30942-f0cbeccf09-bac	GEPTC-10621					V-0000	Banque Cram	QNK	emea	Switzerland	1920 x 1080	1920 x 1080	1920 x 1200	3	5760 x 1200
04/06/2020 12:24	093ced4c-6c97973c91-9f	GEPTC-10621					F-0000	Ofwat	+64	emea	United Kingdc	1920 x 1080			1	1920 x 1080
08/06/2020 11:27	968a7320-7bb8662fb2-f2f	GEPTC-10621					D-0000	NH GP Global Su	3EF	emea	Switzerland	1600 x 900			1	1600 x 900
08/06/2020 11:19	3c2bf381-58599da6fb-f0f	GEPTC-10621					W-0000	Liechtensteir	9-14	emea	Liechtenstein	1280 x 720	1920 x 1200	1920 x 1200	3	5760 x 1200
02/06/2020 14:37	4c4c4544-0c5efac268-9ee	GEPTC-10621					U-0000	DIEBOLD NIX	C-21	amers	United States	1920 x 1080			1	1920 x 1080
08/06/2020 17:11	0ebc4d56-0e5a7c7f02-12	GEPTC-10621					U-0000	DIEBOLD NIX	C-21	amers	United States	1364 x 768			1	1364 x 768
08/06/2020 05:23	4c4c4544-0c21fb483f-ab6	GEPTC-10621					L-0000	Lucror Analy	37W	apac	Singapore	1680 x 1050	1680 x 1050		2	3360 x 1050
05/06/2020 07:06	4c4c4544-0c4cbe2721-d9	GEPTC-10621					R-0000	CONTROL INV	V2C	emea	Italy	1280 x 1024			1	1280 x 1024
04/06/2020 11:27	4c4c4544-0c6602fbf8-c38	GEPTC-10621					T-0000	CONTROL INV	V2C	emea	Italy	1280 x 1024			1	1280 x 1024
08/06/2020 07:48	4c4c4544-0cf0e8dada-5f3	GEPTC-10621					P-0000	CONTROL INV	V2C	emea	Italy	1680 x 1050			1	1680 x 1050
28/05/2020 11:23	20191024-7c363beff0-3bc	GEPTC-10621					A-0000	UK Fundhouse Li	K18	emea	United Kingdc	1920 x 1080			1	1920 x 1080
01/06/2020 11:46	4c4c4544-0c17e71e0f-38	GEPTC-10621					D-0000	TAL Fundhouse Li	K18	emea	United Kingdc	1920 x 1080	2400 x 1350		2	4800 x 1350
02/06/2020 16:30	4c4c4544-0c08fe3907-be	GEPTC-10621					D-0000	FOE Fundhouse Li	K18	emea	United Kingdc	1920 x 1080			1	1920 x 1080
03/06/2020 11:16	2128c3e2-af55ab621f-0f	GEPTC-10621					L-0000	SRU Fundhouse Li	K18	emea	United Kingdc	1920 x 1080			1	1920 x 1080
08/06/2020 11:09	63b3be68-8847acce81-65	GEPTC-10621					V-0000	RG Cebulon VOF	V85	emea	Netherlands	1280 x 1024	1280 x 1024	1280 x 1024	4	5120 x 1024
29/05/2020 11:43	721b4c6c-c328e118b9-a2	GEPTC-10621					L-0000	ST- CASTLETON C	HQ5	emea	United Kingdom		1920 x 1080			
08/06/2020 12:40	721b4c6c-c328e118b9-a2	GEPTC-10621					L-0000	ST- CASTLETON C	HQ5	emea	United Kingdc	2560 x 1440			1	2560 x 1440

Users' Screen Resolutions

Log Analysis

Screen Width

Screen Width	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
	Primary	Secondary	Tertiary		
600 x ****	2	-	1	3	0.0%
800 x ****	20	10	5	35	0.0%
1024 x ****	991	389	123	1,503	0.8%
1366 x ****	12,566	1,175	281	14,022	10.0%
1280 x ****	11,130	7,255	2,970	21,355	8.8%
1400 x ****	24	10	2	36	0.0%
1440 x ****	3,097	1,543	429	5,069	2.5%
1600 x ****	4,378	2,004	492	6,874	3.5%
1680 x ****	4,581	3,872	1,054	9,507	3.6%
1920 x ****	64,049	31,995	10,172	106,216	50.7%
2048 x ****	390	214	34	638	0.3%
2560 x ****	4,924	2,460	715	8,099	3.9%
3840 x ****	1,976	980	219	3,175	1.6%
	108,128	51,907	16,497		85.7%

Screen Height

Screen Height	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
	Primary	Secondary	Tertiary		
**** x 480	13	8	10	31	0.0%
**** x 576	19	-	-	19	0.0%
**** x 600	34	13	5	52	0.0%
**** x 768	14,630	1,751	398	16,779	11.6%
**** x 800	485	103	45	633	0.4%
**** x 900	6,404	2,810	607	9,821	5.1%
**** x 960	256	169	34	459	0.2%
**** x 1024	8,172	6,673	2,573	17,418	6.5%
**** x 1050	4,789	3,878	1,056	9,723	3.8%
**** x 1080	58,981	27,432	8,114	94,527	46.7%
**** x 1200	5,584	4,938	2,182	12,704	4.4%
**** x 1440	4,906	2,477	688	8,071	3.9%
**** x 1536	40	226	57	323	0.0%
**** x 1600	572	147	51	770	0.5%
**** x 2048	55	33	11	99	0.0%
**** x 2160	1,477	897	195	2,569	1.2%
	106,417	51,555	16,026		84.3%

Users' Screen Resolutions

Log Analysis

Most Used Screen Resolutions

Screen Width

Top 4 Most Used (Ranking)	Screen Width	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
		Primary	Secondary	Tertiary		
1st	1920	64,049	31,995	10,172	106,216	50.7%
2nd	1366	12,566	1,175	281	14,022	10.0%
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3rd	1024	8,172	6,673	2,573	17,418	6.5%
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1920 x 1080 = Standard HD Monitor

Users' Screen Resolutions

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3rd	1024	8,172	6,673	2,573	17,418	6.5%
4th	900	6,404	2,810	607	9,821	5.1%

1366 x 768 = Laptop Screen

Users' Screen Resolutions

Log Analysis

Most Used Screen Resolutions

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3rd	1024	8,172	6,673	2,573	17,418	6.5%
4th	900	6,404	2,810	607	9,821	5.1%

1280 x 1024 = Desktop Monitor

Users' Screen Resolutions

Log Analysis

Most Used Screen Resolutions

Screen Width

Top 4 Most Used (Ranking)	Screen Width	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
		Primary	Secondary	Tertiary		
1st	1920	64,049	31,995	10,172	106,216	50.7%
2nd	1366	12,566	1,175	281	14,022	10.0%
3rd	1280	11,130	7,255	2,970	21,355	8.8%
4th	2560	4,924	2,460	715	8,099	3.9%

2560 x 1440 or higher = Widescreen Monitor

Screen Height

Top 4 Most Used (Ranking)	Screen Height	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
		Primary	Secondary	Tertiary		
1st	1080	58,981	27,432	8,114	94,527	46.7%
2nd	768	14,630	1,751	398	16,779	11.6%
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Users' Screen Resolutions

Log Analysis

Most Used Screen Resolutions

Screen Width

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3rd	1280	11,130	7,255	2,970	21,355	8.8%
4th	2560	4,924	2,460	715	8,099	3.9%

1440 or 1600 x 900 = Widescreen Laptop display

Screen Height

Top 4 Most Used (Ranking)	Screen Height	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
		Primary	Secondary	Tertiary		
1st	1080	58,981	27,432	8,114	94,527	46.7%
2nd	768	14,630	1,751	398	16,779	11.6%
3rd	1024	8,172	6,673	2,573	17,418	6.5%
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Users' Screen Resolutions

Log Analysis - Summary

Screen Width

Top 4 Most Used (Ranking)	Screen Width	Monitors			Total Monitor Count	Primary Resolution usage (% of users)
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		Primary	Secondary	Tertiary		
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2nd	768	14,630	1,751	398	16,779	11.6%
3rd	1024	8,172	6,673	2,573	17,418	6.5%
4th	900	6,404	2,810	607	9,821	5.1%

- **Most used screen resolution:** 1920 x 1080 (HD Display) - Monitor - 50.7 % of all usage
- **2nd most used screen resolution:** 1366 x 768 (16:9 widescreen Laptop display) - 10 % of all usage
- **3rd most used screen resolution:** 1280 x 1024 (SXGA display) - 8.8 % of all usage
- **4th most used screen resolution:** 2560 x 1440 or higher (Extra-Large widescreen displays) - 3.9 % of all usage
- **4th most used screen height:** 900px high - refers to screens 1440 x 900 , 1600 x 900 (WXGA displays - Laptops)
- **Possibility that laptop use is higher during this period due to increased home-working from Covid-19 lockdown.**

Number of screens

Log Analysis

- **51 % of user sessions were using just one screen**
- **30.8 % were using 2 screens**
- **8.9 % were using 3 screens**
- **3.4 % were using 4 screens**
- **1% were using 5,6 and 8 screens (combined figures)**

- **Most screens used: 15 (5 monitors wide by 3 monitors high)**

% of User Sessions	No. of User Sessions	No. of Screens
51.0%	64,346	1 Screen
30.8%	38,908	2 Screens
8.9%	11,205	3 Screens
3.4%	4,292	4 Screens
0.3%	438	5 Screens
0.6%	733	6 Screens
0.0%	50	7 Screens
0.1%	111	8 Screens
0.0%	6	9 Screens
0.0%	3	10 Screens
0.0%	-	11 Screens
0.0%	7	12 Screens
0.0%	-	13 Screens
0.0%	2	14 Screens
0.0%	3	15 Screens
0.0%	-	16 Screens
0.0%	-	17 Screens
0.0%	-	18 Screens
0.0%	-	19 Screens
0.0%	-	20 Screens
0.0%	-	21 Screens

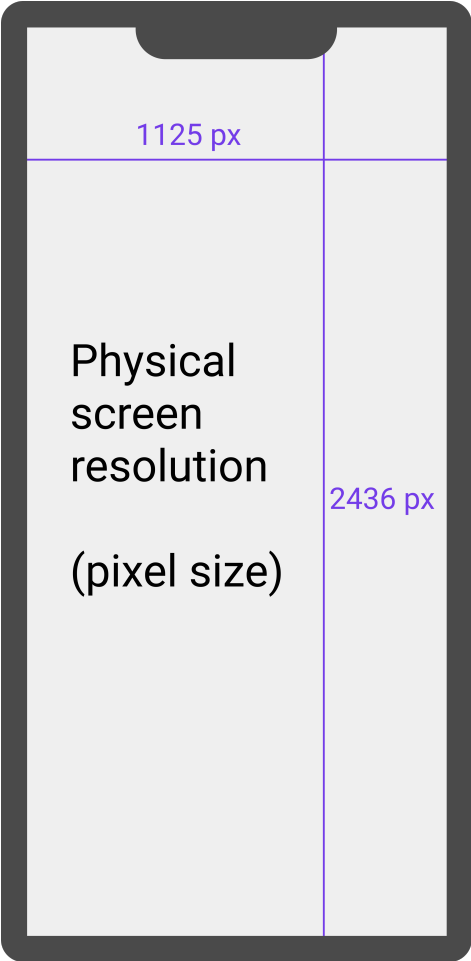


Screen Resolutions

Mobile Device considerations

Resolution vs Viewport

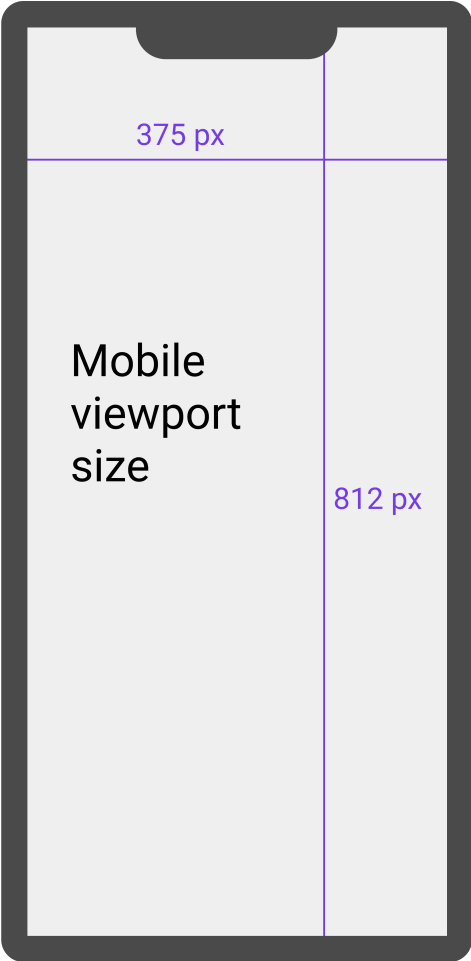
Screen resolution



Translates to



Viewport



Viewports are scaled down versions of resolutions that allows sites to be viewed more consistently across different devices. A single viewports caters for multiple resolution sizes.

Example: iPhone X and XS

Common Mobile Screen Resolutions and Viewports

Microsoft Devices

	Pixel Size	Viewport
Surface Pro		
Surface Pro 3	1440 x 2160	1024 x 1440
Surface Pro 2	1080 x 1920	720 x 1280
Surface Pro	1080 x 1920	720 x 1280

Apple Devices

	Pixel Size	Viewport
iPhone		
iPhone XR	828 x 1792	414 x 896
iPhone XS	1125 x 2436	375 x 812
iPhone XS Max	1242 x 2688	414 x 896
iPhone X	1125 x 2436	375 x 812
iPhone 8 Plus	1080 x 1920	414 x 736
iPhone 8	750 x 1334	375 x 667
iPhone 7 Plus	1080 x 1920	414 x 736
iPhone 7	750 x 1334	375 x 667
iPhone 6 Plus/6S Plus	1080 x 1920	414 x 736
iPhone 6/6S	750 x 1334	375 x 667
iPhone 5	640 x 1136	320 x 568
iPod		
iPod Touch	640 x 1136	320 x 568
iPad		
iPad Pro	2048 x 2732	1024 x 1366
iPad Third & Fourth Generation	1536 x 2048	768 x 1024
iPad Air 1 & 2	1536 x 2048	768 x 1024
iPad Mini 2 & 3	1536 x 2048	768 x 1024
iPad Mini	768 x 1024	768 x 1024

Android Devices

	Pixel Size	Viewport
Phones		
Nexus 6P	1440 x 2560	412 x 732
Nexus 5X	1080 x 1920	412 x 732
Google Pixel 3 XL	1440 x 2960	412 x 847
Google Pixel 3	1080 x 2160	412 x 824
Google Pixel 2 XL	1440 x 2560	412 x 732
Google Pixel XL	1440 x 2560	412 x 732
Google Pixel	1080 x 1920	412 x 732
Samsung Galaxy Note 9	1440 x 2960	360 x 740
Samsung Galaxy Note 5	1440 x 2560	480 x 853
LG G5	1440 x 2560	480 x 853
One Plus 3	1080 x 1920	480 x 853
Samsung Galaxy S9+	1440 x 2960	360 x 740
Samsung Galaxy S9	1440 x 2960	360 x 740
Samsung Galaxy S8+	1440 x 2960	360 x 740
Samsung Galaxy S8	1440 x 2960	360 x 740
Samsung Galaxy S7 Edge	1440 x 2560	360 x 640
Samsung Galaxy S7	1440 x 2560	360 x 640
Tablets		
Nexus 9	1536 x 2048	768 x 1024
Nexus 7 (2013)	1200 x 1920	600 x 960
Samsung Galaxy Tab 10	800 x 1280	800 x 1280
Chromebook Pixel	2560 x 1700	1280 x 850

Sources: <https://docs.adobe.com/content/help/en/target/using/experiences/vec/mobile-viewports.html>
<https://mediag.com/blog/popular-screen-resolutions-designing-for-all/>
<https://viewportsizer.com/devices/>

Screen Resolutions

What about Mobile Devices?

- **Minimum viewport size across mobile devices:**

320 px wide



Why is the minimum viewport size of 320 px wide important?

- It's the minimum width available for an “app” and its content or a separate content panel to be displayed on a mobile device.

This is important to note when designing responsive applications.

e.g.

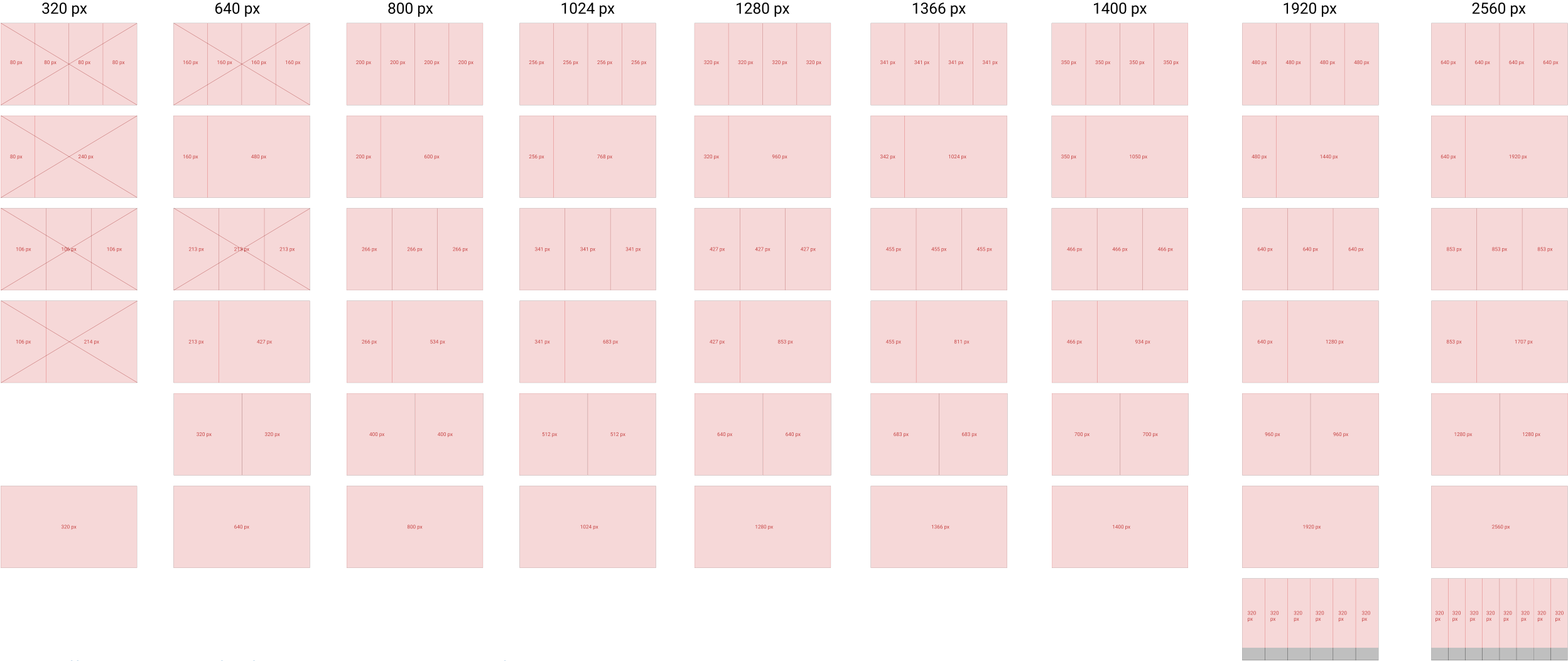
- **A Monitor app containing a watchlist**
- **Navigational or auxiliary panel**

- **It is also a suitable size for content displayed within a layout on larger screen sizes.**

Sources: <https://docs.adobe.com/content/help/en/target/using/experiences/vec/mobile-viewports.html>
<https://mediag.com/blog/popular-screen-resolutions-designing-for-all/>
<https://viewportsizer.com/devices/>

Screen Resolutions & Viewport Sizes

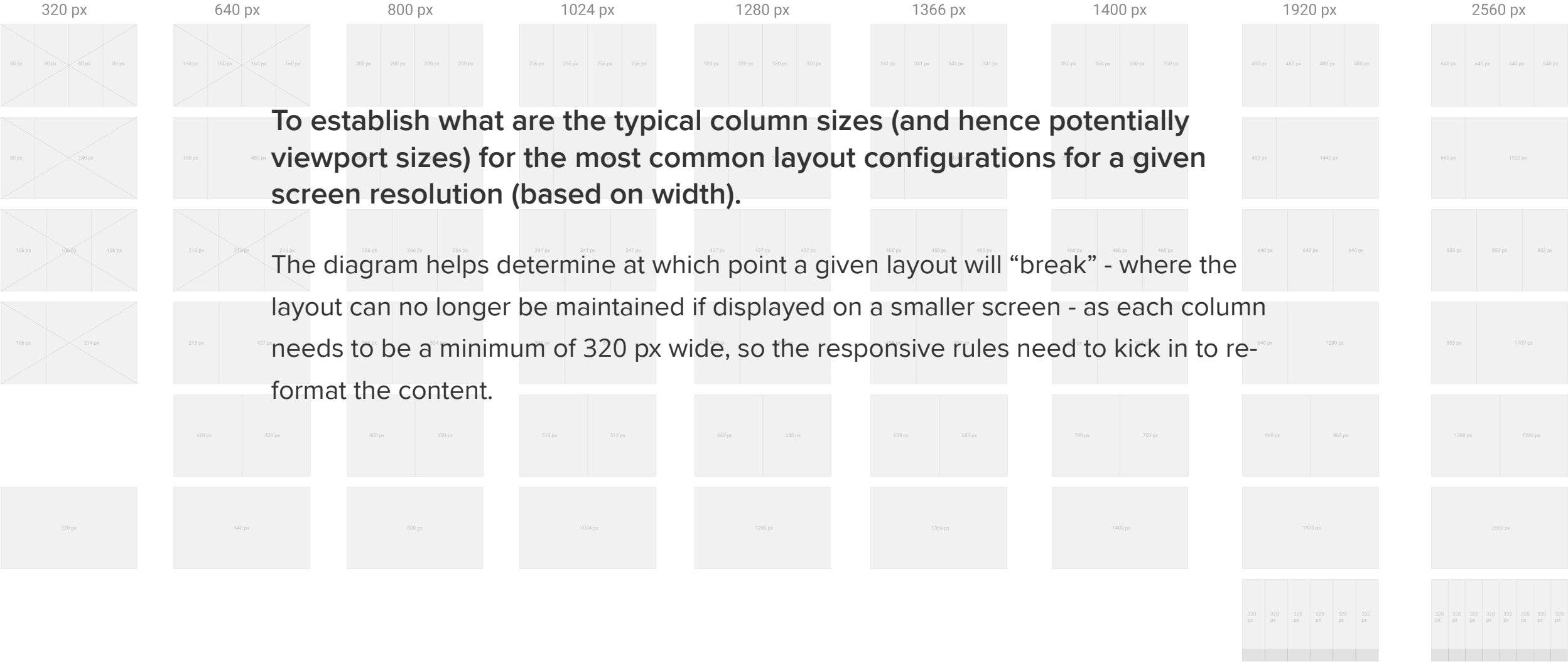
Mobile, Tablet and Laptop/Desktop



<https://www.figma.com/file/4jja4nMpCOPqsp5zSd9g0D/Breakpoints-Research?node-id=90%3A0>

Screen Resolutions & Viewport Sizes

What's the point of this exercise?



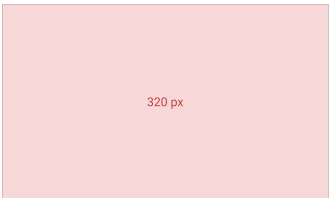
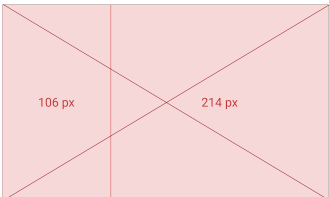
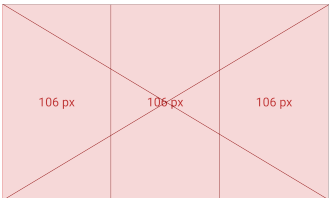
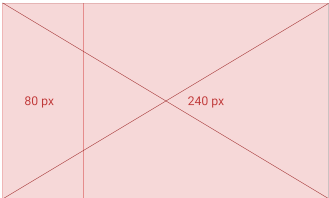
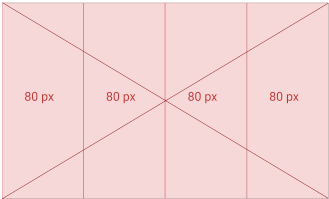
To establish what are the typical column sizes (and hence potentially viewport sizes) for the most common layout configurations for a given screen resolution (based on width).

The diagram helps determine at which point a given layout will “break” - where the layout can no longer be maintained if displayed on a smaller screen - as each column needs to be a minimum of 320 px wide, so the responsive rules need to kick in to re-format the content.

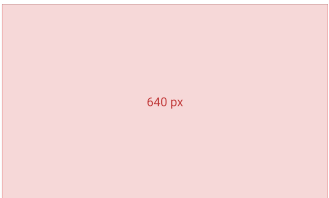
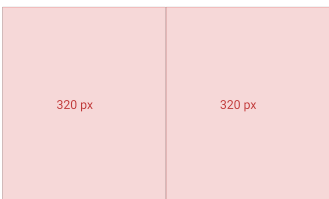
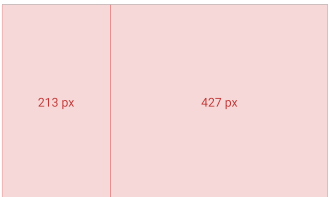
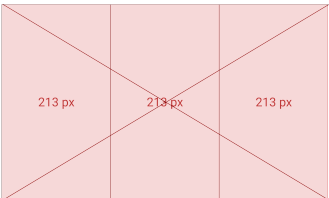
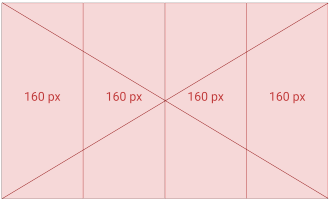
Screen Resolutions & Viewport Sizes

Mobiles, Tablets

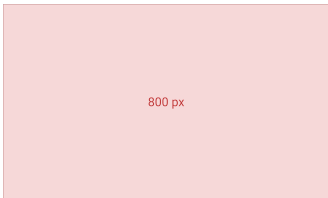
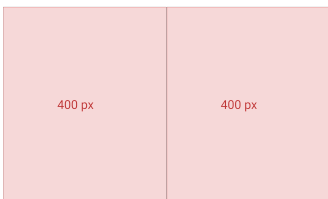
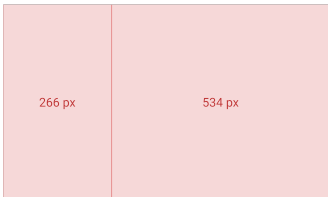
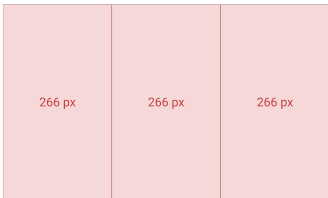
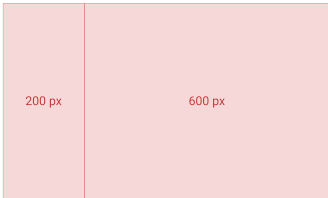
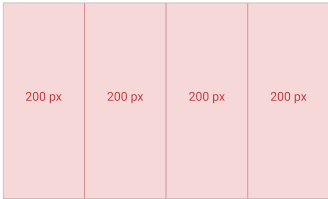
320 px



640 px



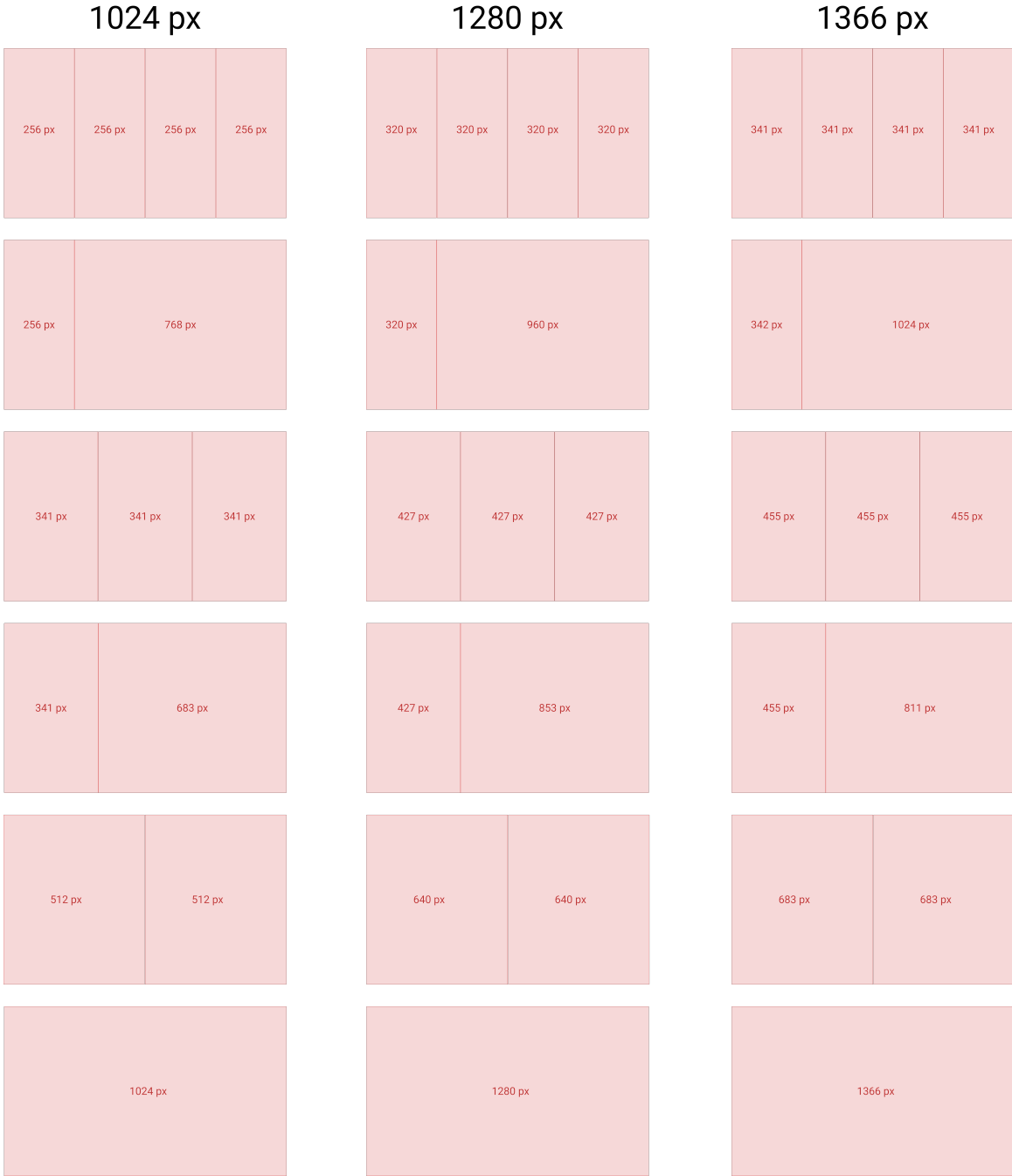
800 px



<https://www.figma.com/file/4jja4nMpCOpqsp5zSd9g0D/Breakpoints-Research?node-id=90%3A0>

Users' Screen Resolutions

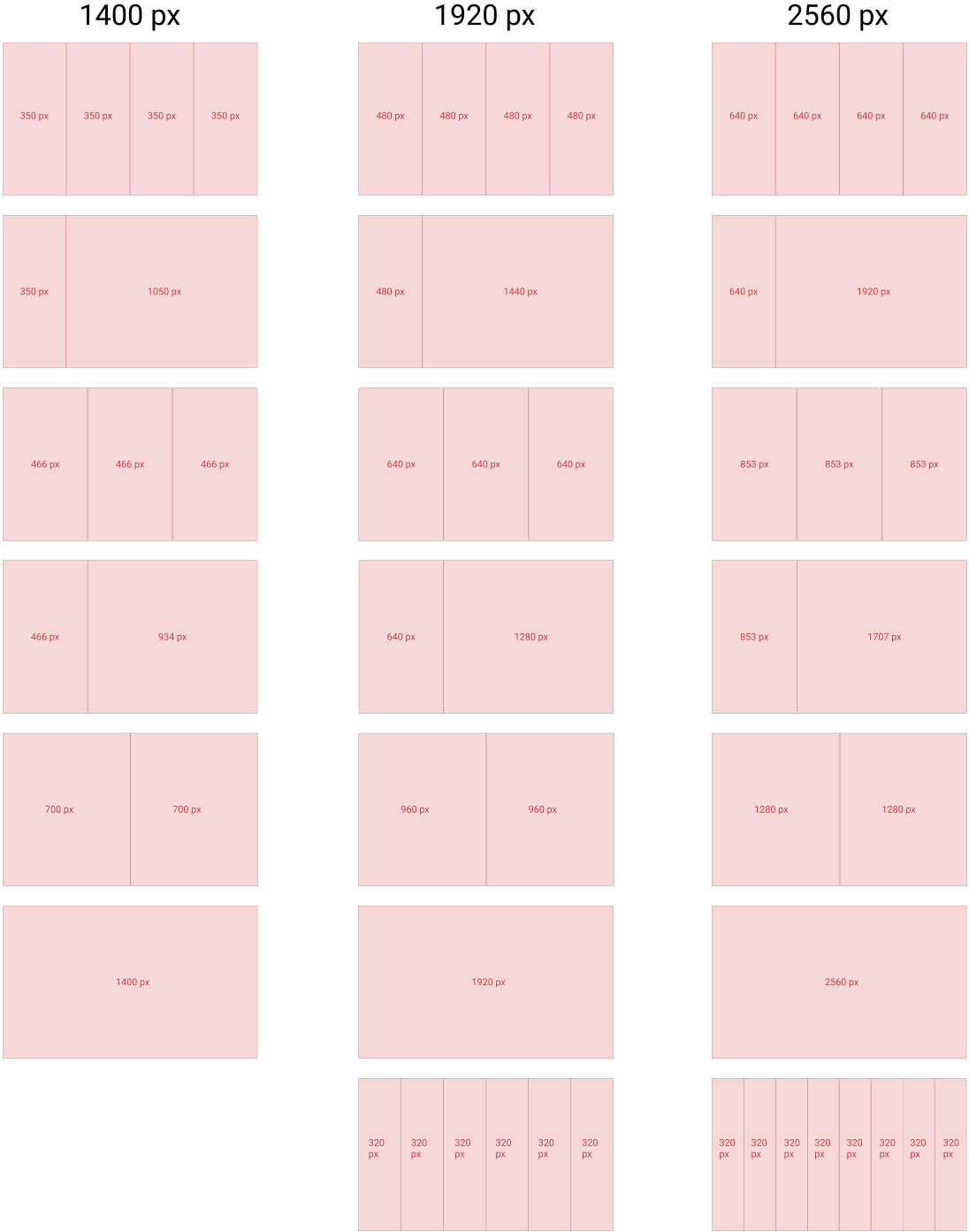
Tablets and Laptops



<https://www.figma.com/file/4jja4nMpCOpqsp5zSd9g0D/Breakpoints-Research?node-id=90%3A0>

Users' Screen Resolutions

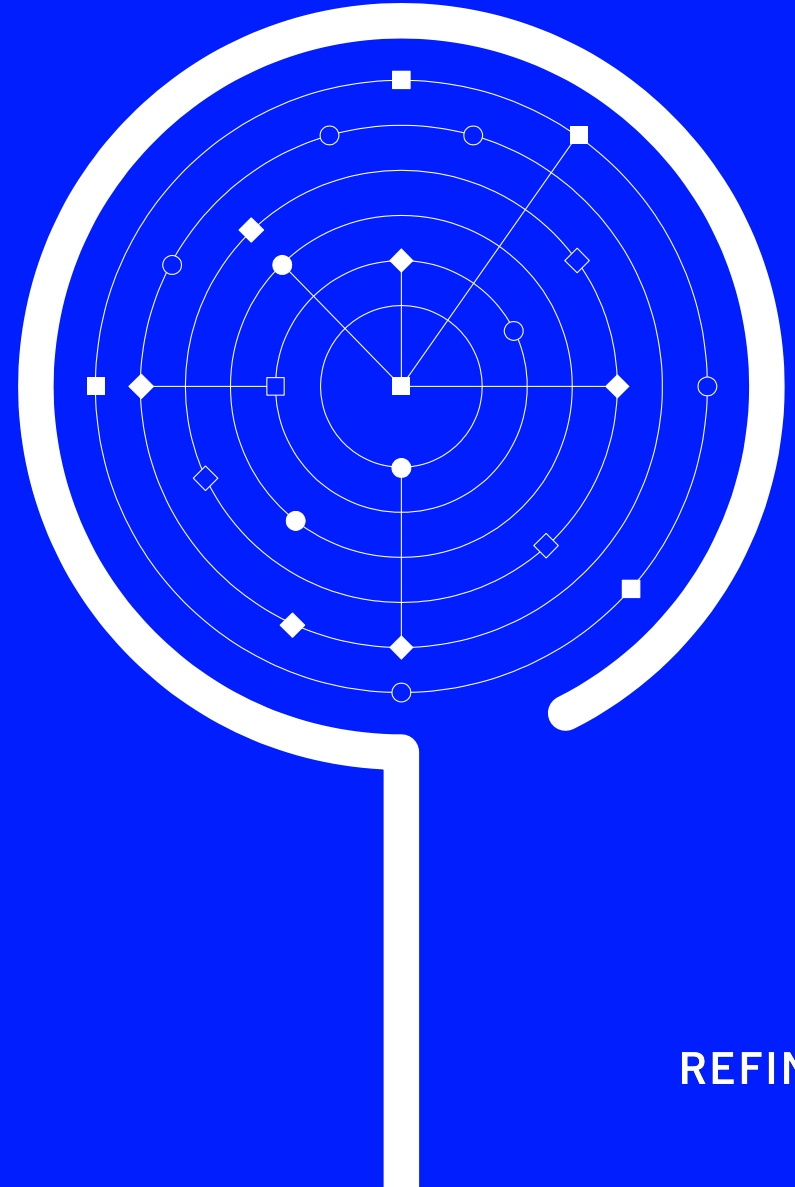
Laptops and Desktops



<https://www.figma.com/file/4jja4nMpCOpqsp5zSd9g0D/Breakpoints-Research?node-id=90%3A0>

Other Design Systems

How do other frameworks deal with breakpoints?

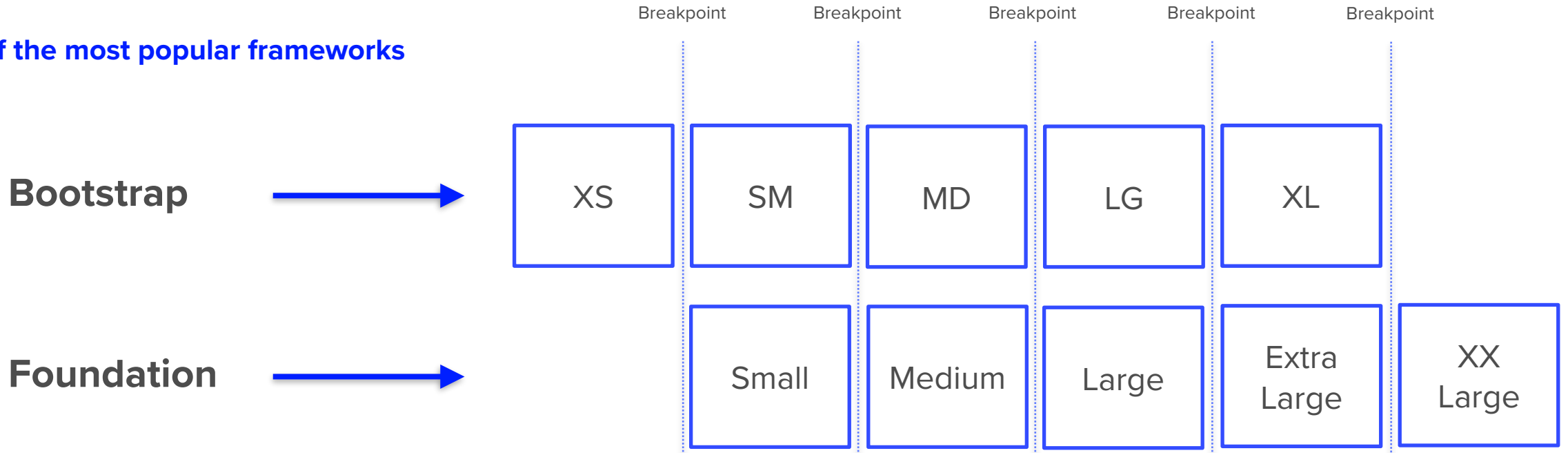


Screen Resolutions & Viewport Sizes

Grouping Device Screen Resolution & Viewport Sizes

- **Modern CSS Grid Layout Frameworks used to build web sites and applications generally use a 'T-Shirt Sizing' naming convention to group screen resolutions**
- **Establishes 'Breakpoints' that govern responsive behaviour**

Two of the most popular frameworks



Sources: <https://getbootstrap.com/docs/4.5/layout/overview/>
<https://get.foundation/sites/docs/grid.html>

Screen Resolutions & Viewport Sizes

Grouping Device Screen Resolution & Viewport Sizes

List of CSS Frameworks

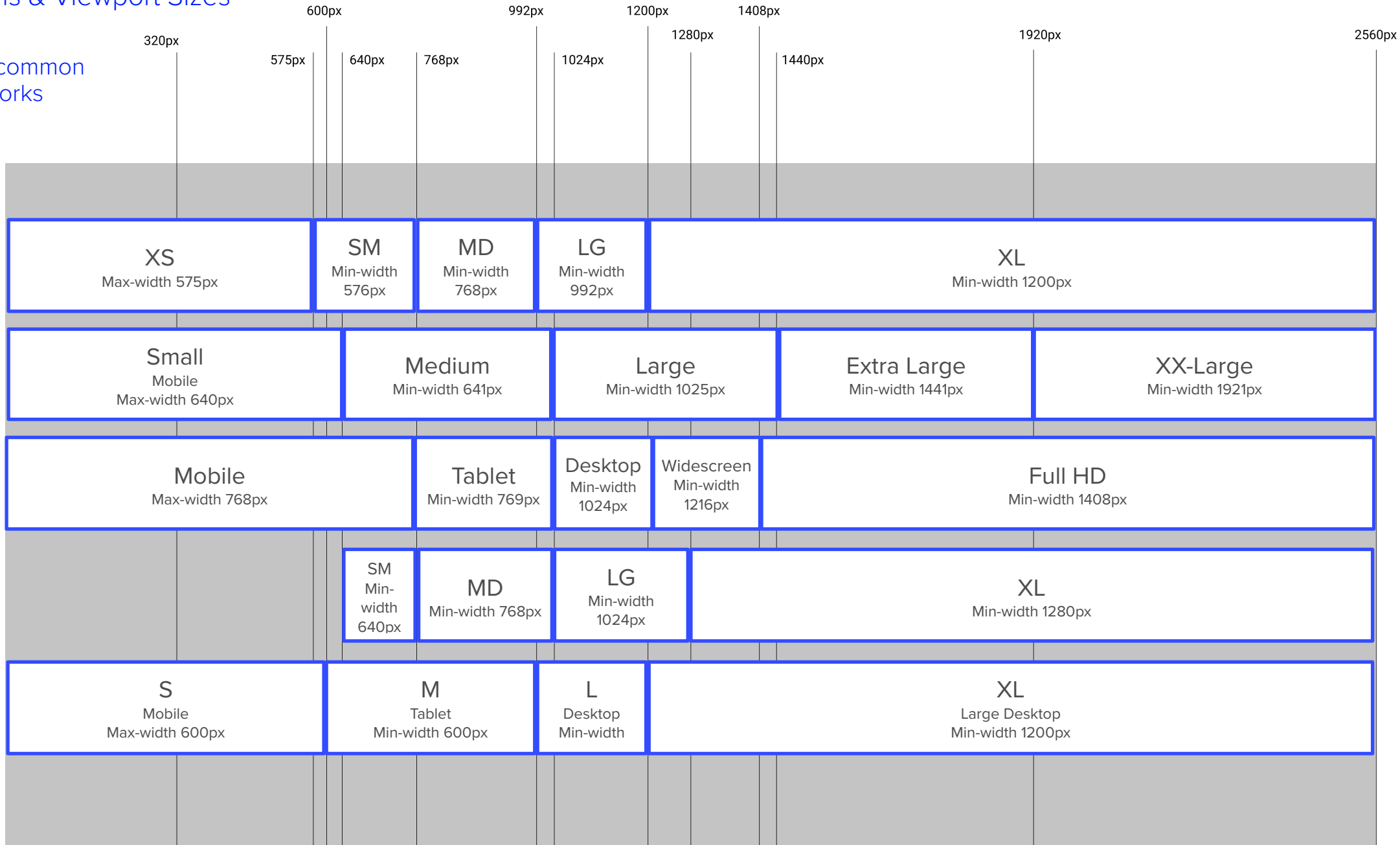
Bootstrap	→	XS Max-width 575px	SM Min-width 576px	MD Min-width 768px	LG Min-width 992px	XL Min-width 1200px	
Foundation	→		Small Mobile Max-width 640px	Medium Min-width 641px	Large Min-width 1025px	Extra Large Min-width 1441px	XX-Large Min-width 1921px
Bulma	→	Mobile Max-width 768px	Tablet Min-width 769px	Desktop Min-width 1024px	Widescreen Min-width 1216px	Full HD Min-width 1408px	
Tailwind	→		SM Min-width 640px	MD Min-width 768px	LG Min-width 1024px	XL Min-width 1280px	
Materialize	→		S Mobile Max-width 600px	M Tablet Min-width 600px	L Desktop Min-width 992px	XL Large Desktop Min-width 1200px	

Sources: <https://getbootstrap.com/docs/4.5/layout/overview/>
<https://get.foundation/sites/docs-v5/media-queries.html>
<https://bulma.io/documentation/overview/responsiveness/>

<https://tailwindcss.com/docs/responsive-design>
<https://materializecss.com/grid.html>

Screen Resolutions & Viewport Sizes

Breakpoints across common CSS Layout Frameworks



Screen Resolutions & Viewport Sizes

Breakpoints across common
CSS Layout Frameworks

Conclusion(s)

- **No real consistent standard set of breakpoints to use**

Establishing Breakpoints for Workspace

Breakpoints Dataset

29,310 App Requests coming from Web Browsers, from the 18th of May to the 17th of June

3,300 have an unknown app name request (only URL is captured)

About 2/3 of App Request come from 20 apps (from 400 in the dataset)

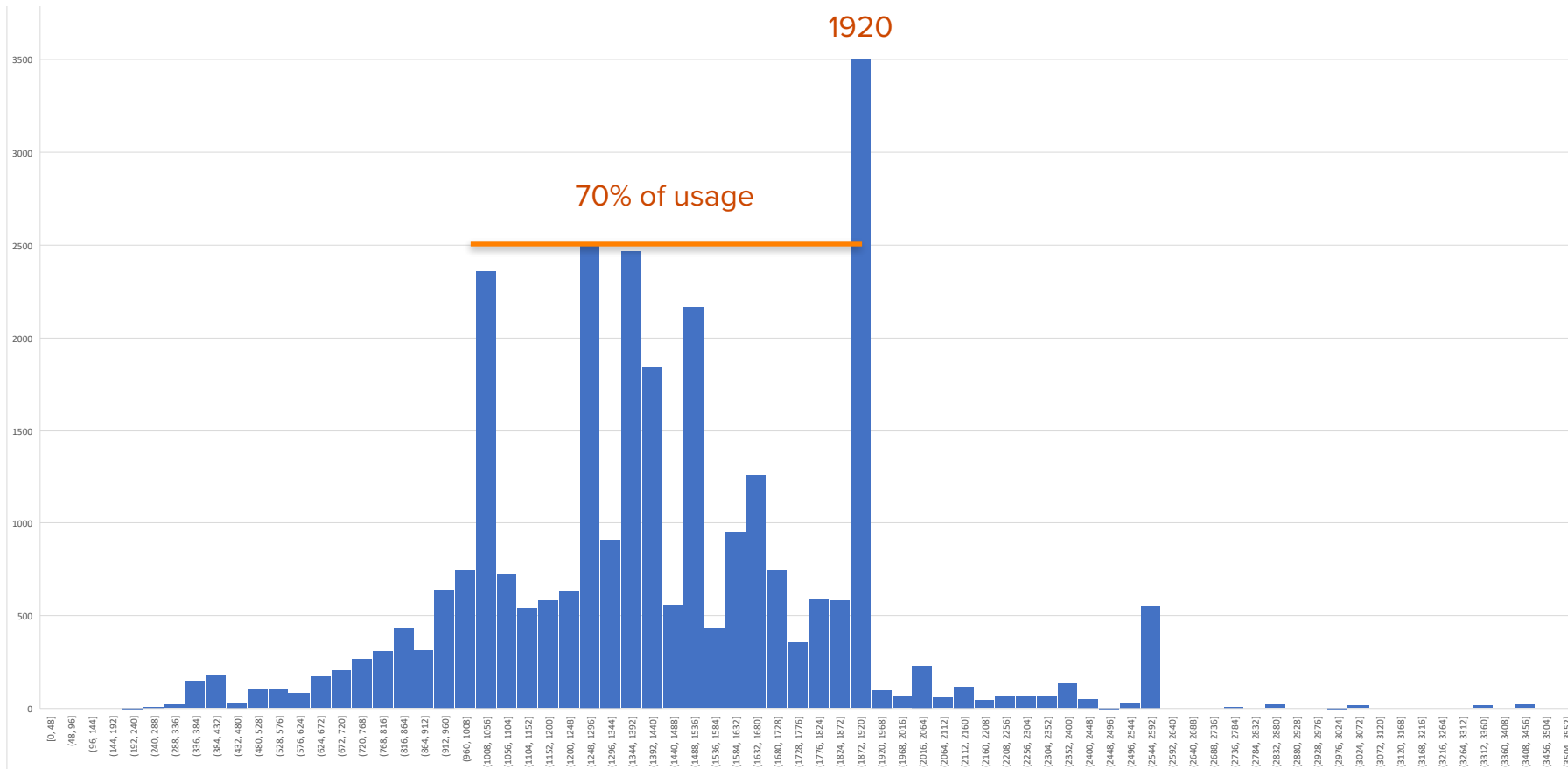
		App Requests	Average WIDTH	Average HEIGHT	Min WIDTH	Min HEIGHT	Max WIDTH	Max HEIGHT
1	Monitor	2234	1437.09	812.64	233	108	3440	2635
2	Chart	2163	1457.39	817.44	233	121	3440	2635
3	News Monitor	2135	1448.33	803.30	233	121	3440	2417
4	Home	1851	1447.55	811.65	320	247	3440	1974
5	Quote Line	1828	1448.56	808.42	233	108	3440	2635
6	Public Company Overview	1351	1448.86	817.06	150	108	3440	2417
7	Instrument Overview	890	1444.12	816.23	357	108	3440	1648
8	App Library	723	1451.41	809.79	216	66	3072	2417
9	Top News	715	1464.00	845.77	360	226	3440	1689
10	Quote App	598	1448.38	808.99	360	226	3440	2417
11	Stocks Guide	508	1463.15	800.05	360	215	2560	1410
12	Advanced Research Search	376	1374.28	804.07	320	314	2560	1442
13	Portfolio Analytics	291	1487.18	808.56	504	191	2844	1576
14	Watchlist Pulse	268	1494.92	806.48	375	308	2844	1513
15	Screener	247	1481.46	793.60	504	121	2560	1576
16	Covid-19	241	1455.34	812.04	375	286	3440	1844
17	Bond View	221	1522.39	900.64	375	406	3350	2635
18	Equities Guide	216	1518.81	812.93	412	394	2844	1513
19	My Profile and Directory	206	1488.55	805.65	414	332	3072	1377
20	Other Apps	8945	1425.86	789.41	284	115	3440	2635
	Grand Total	26007	1442.80	805.05	150	66	3440	2635

Distribution analysis - Breakpoint Width

The breakpoint width histogram does not follow a normal curve. We analysed the distribution and we found that:

1. **1920 dp** most common width (*mode*)
2. **About 15% of app** requests have a viewport of 1920dp or more)

3. **70% of app** requests have a viewport of ≥ 1024 dp and < 1920 dp
4. **About 15%** have 1024 dp or less



Percentiles

0	150
5	788
10	956
15	1026
20	1042
25	1140
30	1257
35	1280
40	1325
45	1366
50	1397
55	1440
60	1524
65	1536
70	1630
75	1706
80	1821
85	1920
90	1920
95	2048
100	3529

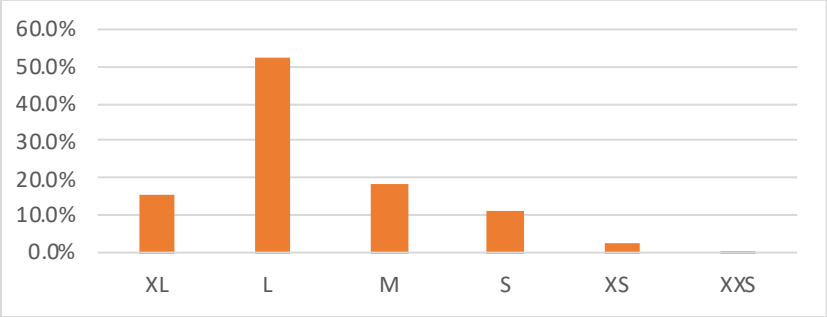
Breakpoints Analysis and Comparison

We chose the **2nd option** as it has a more balanced distribution (i.e. normal curve).

Breakpoints are more equally spaced and each cater for a significant amount of usage (except XS)

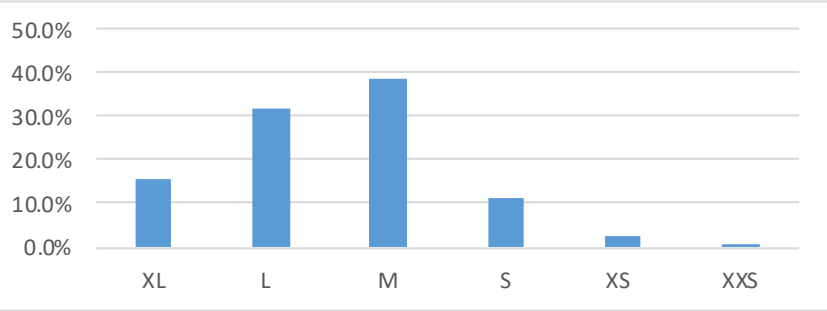
OPTION 1

	XL	L	M	S	XS	XXS	Total
# apps requests	1920	1280	1024	640	320	0	29310
%	15.84%	52.15%	18.18%	11.18%	2.54%	0.10%	

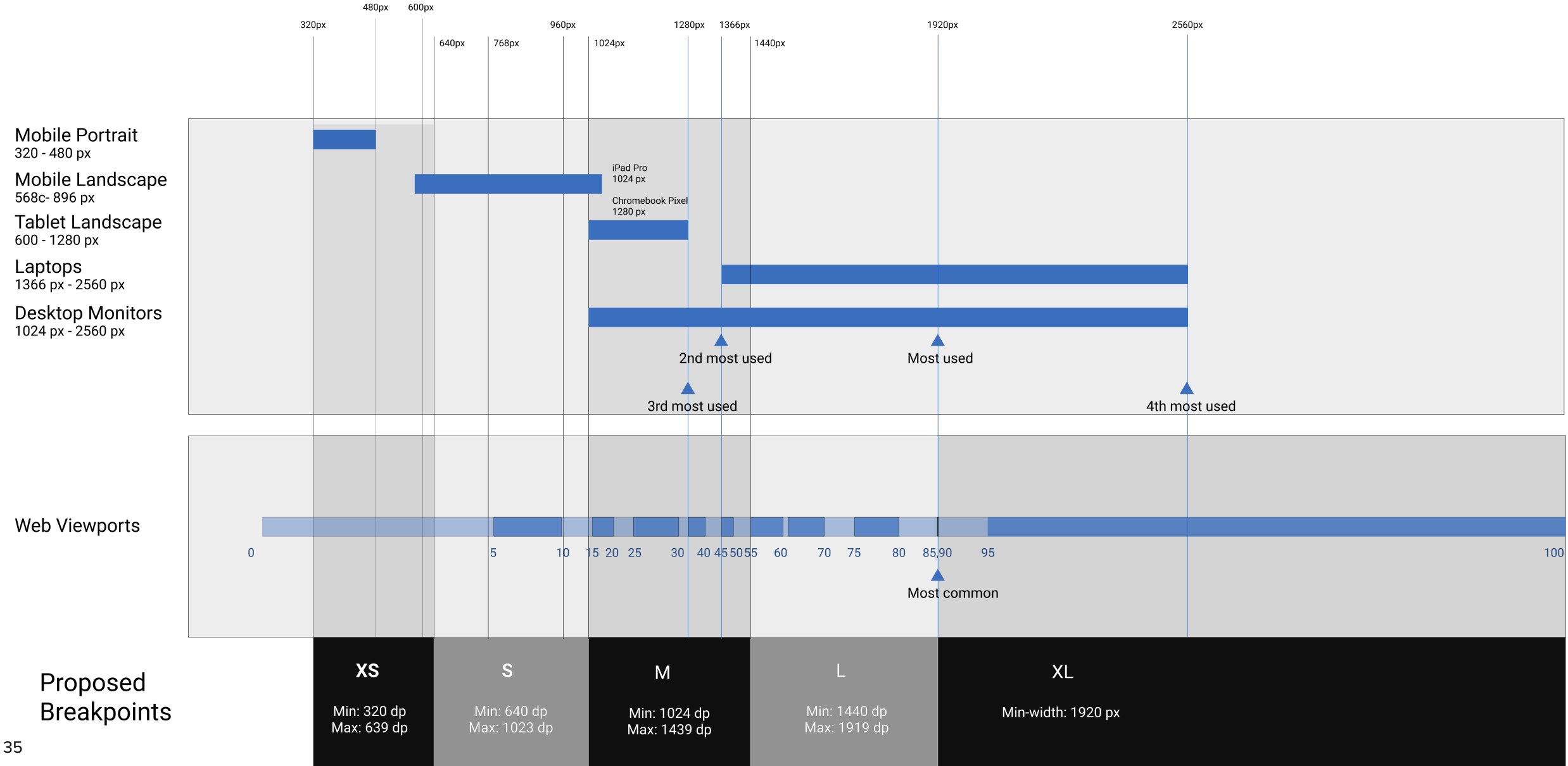


OPTION 2

Breakpoint size	XL	L	M	S	XS	XXS	Total
# apps requests	1920	1440	1024	640	320	0	29310
%	15.84%	31.62%	38.71%	11.18%	2.54%	0.10%	



Screen Resolutions and Viewports | Establishing Breakpoints for Workspace



Breakpoints Analysis by App

We have used a heat map to identify significant variations from the average breakpoint distributions

Monitor is viewed more frequently than average with XS breakpoints

Home is viewed frequently in L, less frequently in XL (?)

Quote app tends to be viewed more often than average by people with **XL** and **XS** viewports

Advanced Research Search is viewed often on XS

Screeener is often viewed with **Large** viewports, **less frequently with XL** and **XS**

Bond view is often viewed with **XL** viewports, very little XS

Covid-19 App is often viewed in XS

Note: 3,300 unnamed app request have been removed from the total

		1920	1440	1024	640	320
	App Request	% XL	% L	% M	% S	%XS
Monitor	2234	14.91%	33.84%	36.03%	11.41%	3.67%
Chart	2163	15.49%	34.81%	36.20%	10.73%	2.64%
News Monitor	2135	15.46%	33.54%	37.10%	10.87%	2.90%
Home	1851	13.07%	35.93%	38.68%	9.72%	2.59%
Quote Line	1828	15.43%	34.35%	37.14%	9.57%	3.34%
Public Company Overview	1351	15.99%	31.75%	37.01%	12.36%	2.74%
Instrument Overview	890	15.39%	32.36%	36.63%	12.47%	3.15%
App Library	723	15.35%	34.85%	36.10%	11.07%	2.49%
Top News	715	17.06%	33.57%	36.50%	10.21%	2.66%
Quote App	598	20.23%	30.27%	33.61%	11.20%	4.68%
Stocks Guide	508	16.54%	33.86%	36.61%	9.84%	3.15%
Advanced Research Search	376	14.10%	27.93%	42.55%	11.97%	3.46%
Portfolio Analytics	291	16.49%	35.74%	36.77%	9.62%	1.37%
Watchlist Pulse	268	19.78%	32.84%	38.81%	7.46%	1.12%
Screeener	247	13.36%	42.51%	34.41%	8.50%	1.21%
Covid-19	241	16.60%	35.27%	33.61%	10.37%	4.15%
Bond View	221	19.91%	35.75%	36.65%	7.24%	0.45%
Equities Guide	216	18.06%	38.89%	35.19%	6.02%	1.85%
My Profile and Directory	206	17.96%	34.95%	40.29%	5.34%	1.46%
Other Apps	8945	17.76%	27.22%	43.19%	10.46%	1.35%
Grand Total	26007	16.34%	31.67%	39.03%	10.52%	2.38%

In Summary

Proposed Workspace Horizontal Breakpoints

Mobile
Portrait
320 - 480 dp



Mobile
Landscape
568 - 896 dp



Tablet
Portrait
600 - 850 dp



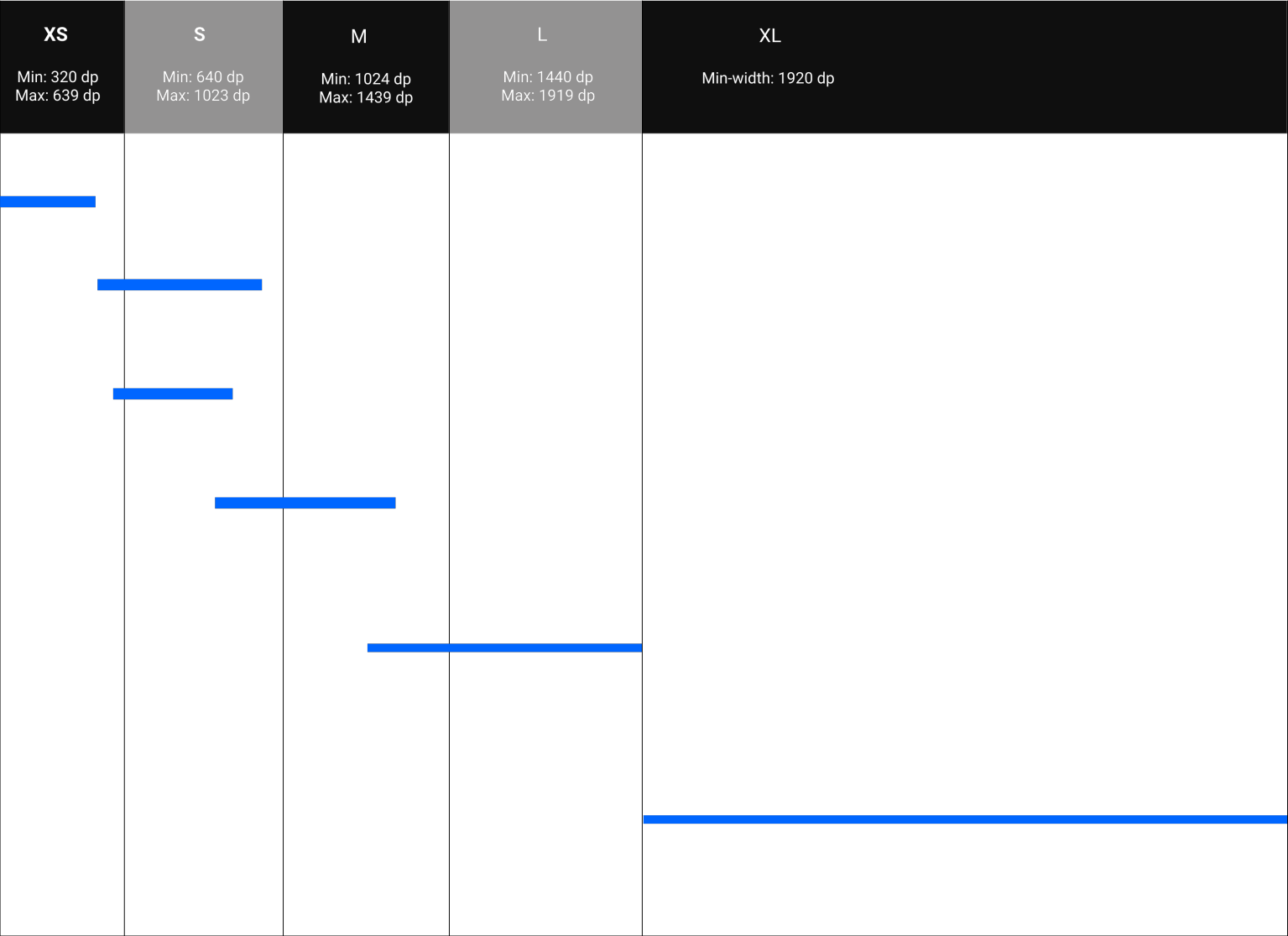
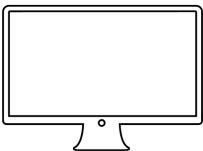
Tablet
Landscape
800 - 1280 dp



Laptop &
Small Display
1366 - 1900 dp



Large Display
1900 dp+



Next Steps

APP FRAMEWORK TEAM

1. Investigate how can we integrate the breakpoints dataset with:

- Layouts
- Apps embedded within the layouts
- Desktop client breakpoints data

2. Monitor trends every 6 months

DESIGN TEAM

3. App and Framework design and engineering should encompass all 5 breakpoints

- Don't discount mobile breakpoints
- Explore larger breakpoint (XL)