ACTIVATE TECHNOLOGY & MEDIA OUTLOOK 2021

activate
consulting
www.activate.com

WSJ TECH LIVE

12 Takeaways from the Activate Technology & Media Outlook 2021

Time and Attention: **The entire growth curve for consumer time spent with technology and media has shifted upwards and will be sustained at a higher level than ever before, opening up new opportunities.**

Video Games: **Gaming is the new technology paradigm as most digital activities (e.g. search, social, shopping, live events) will increasingly take place *inside* of gaming. All of the major technology platforms will expand their presence in the gaming stack, leading to a new wave of mergers and technology investments.**

AR/VR: **Augmented reality and virtual reality are on the verge of widespread adoption as headset sales take off and use cases expand beyond gaming into other consumer digital activities and enterprise functionality.**

Video: **By 2024, nearly all American households will have a Connected TV. The average paid video streaming subscriber will own 5.7 subscriptions, while also watching other services for free (e.g. sharing passwords, using advertising-supported services, viewing social video).**

eCommerce: **The growth curve of eCommerce has accelerated by 5 years in 5 months. Consumers will expand their digital shopping destinations beyond the retailers that they bought from before shelter-in-place. Marketplace platforms and the shift to online grocery buying will level the eCommerce playing field for large traditional retailers and brands.**

Esports: **During shelter-in-place, esports *were* sports for many consumers; going forward, esports will be a major global catalyst for interest in interactive gaming, technology, and entertainment experiences.**

activate
consulting
www.activate.com

Continued →

12 Takeaways from the Activate Technology & Media Outlook 2021

Sports Tech and Sports: New technologies will reshape every aspect of sports, including data, athlete performance, and viewing experiences. If the broadcast rights are maintained, sports fans will create a floor for Pay TV households and a ceiling for cord cutting.

Sports Betting: By 2024, we forecast $24B in sports betting revenues for technology and media companies, enabled by state legalization as well as advanced sports viewing experiences and functionality.

Super Users: To drive growth, technology and media companies will need to focus their efforts on super-serving the 23% of all users who account for the overwhelming majority of time and money spent on eCommerce, video, gaming, virtual reality, and music.

Connectivity: A large percentage of consumers will upgrade to 5G mobile devices and higher bandwidth speeds, as they dramatically expand their use of digital technologies such as telemedicine, video conferencing, video streaming, digital fitness, and cloud gaming.

Advertising: For marketers and media and technology companies, the elimination of third-party cookies by the end of 2021 will create the critical need for entirely new ways of identifying consumers and personalizing their advertising experience.

Growth Dollars: Between 2020 and 2024, technology and media companies will add over $374B in revenue growth dollars. It's going to be an exciting couple of years!

activate
consulting
www.activate.com

CONTENTS

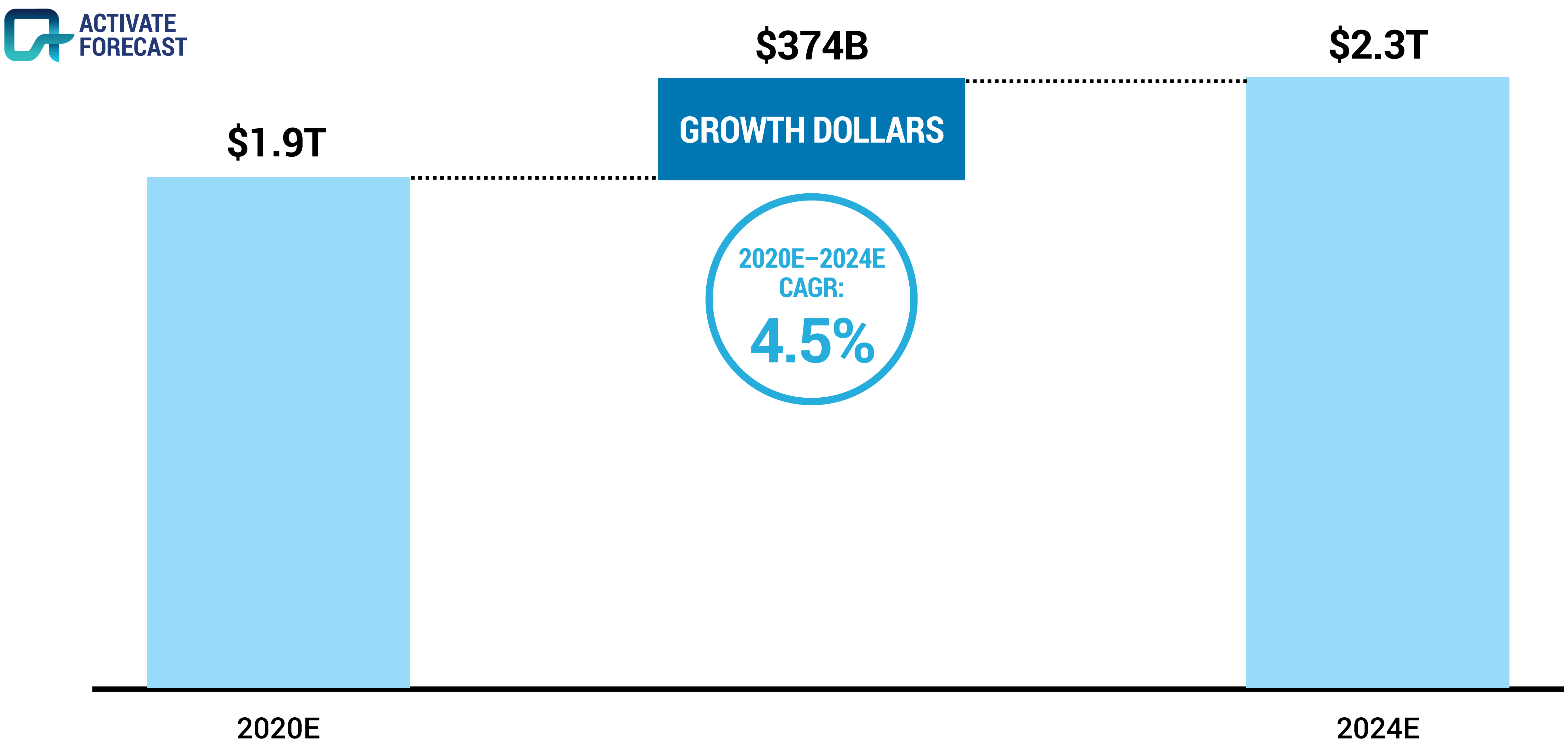
activate consulting
www.activate.com

CONTENTS

activate
consulting
www.activate.com

We forecast significant growth ahead: on a global basis, internet and media businesses will add almost $375B in growth dollars

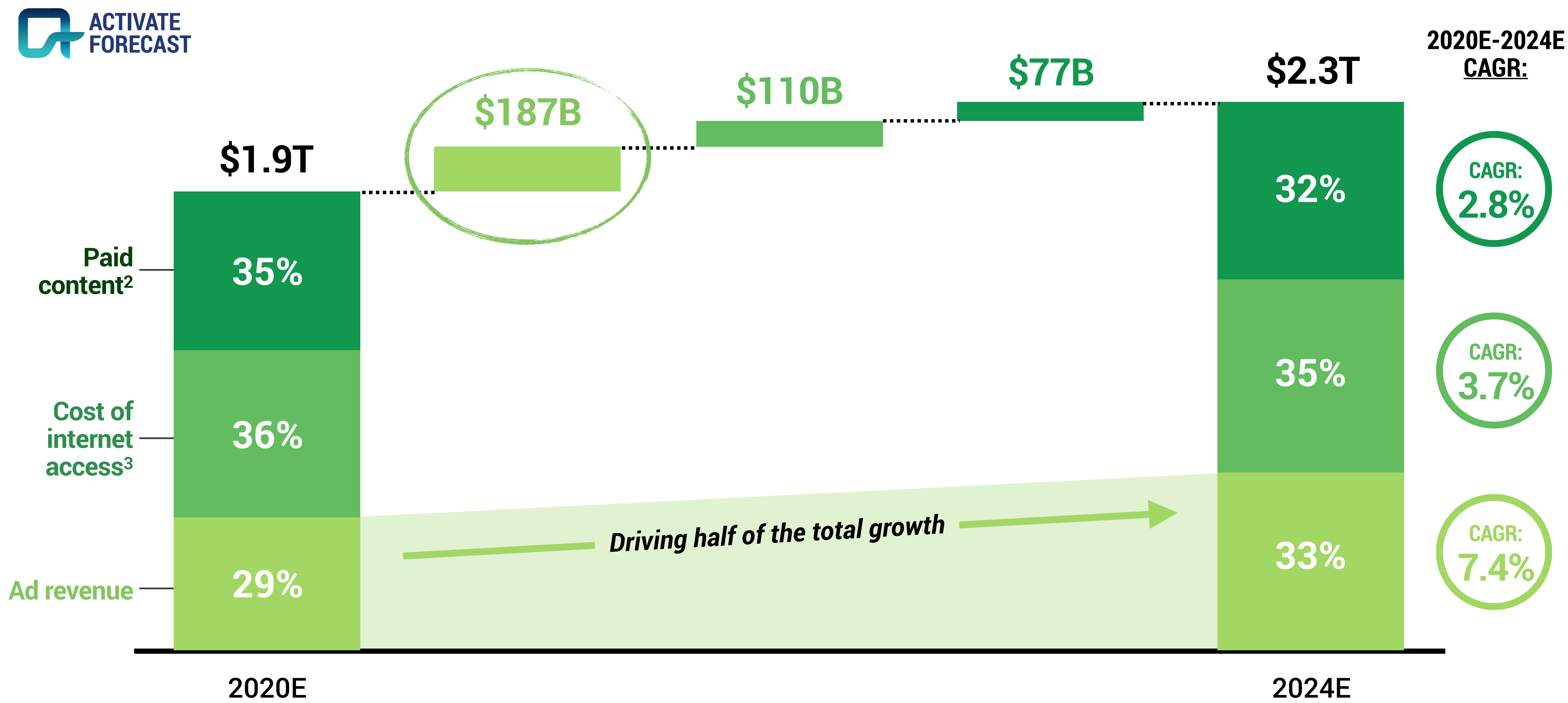
INTERNET AND MEDIA REVENUES[1], GLOBAL, 2020E VS. 2024E, USD



1. "Internet and media revenues" include radio, recorded music, magazine publishing, newspaper publishing, video games, filmed entertainment, book publishing, TV subscription and licensing fees, internet access, digital advertising, and traditional advertising on these platforms.
Sources: Activate analysis, eMarketer, GroupM, PricewaterhouseCoopers, ZenithOptimedia Group

Recovering from the COVID-19 dip in 2020, growth in advertising will far outpace internet access and paid content

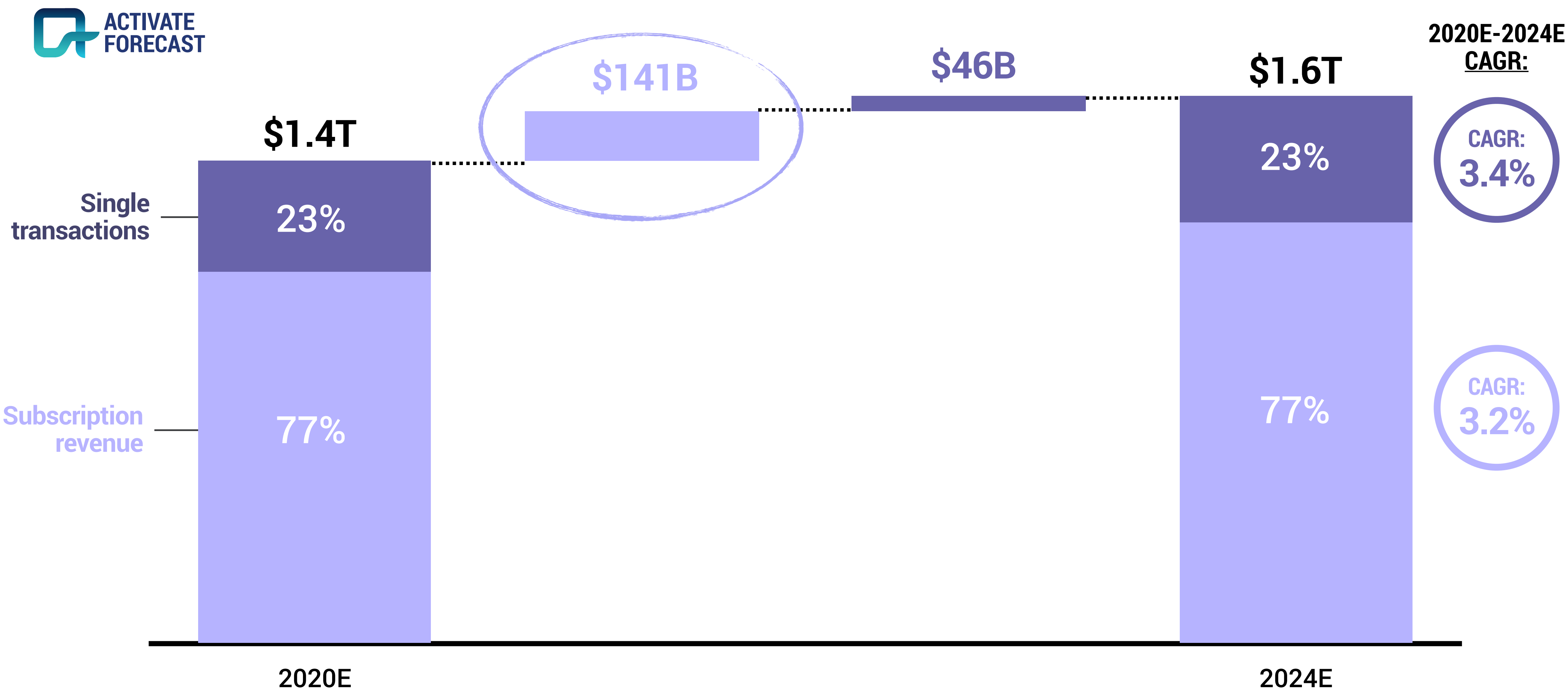
INTERNET AND MEDIA REVENUE[1] GROWTH BY SEGMENT, GLOBAL, 2020E VS. 2024E, USD



1. "Internet and media revenues" include radio, recorded music, magazine publishing, newspaper publishing, video games, filmed entertainment, book publishing, TV subscription and licensing fees, internet access, digital advertising, and traditional advertising on these platforms. 2. "Paid content" includes music, magazine publishing, book publishing, newspapers, video games, television, and filmed entertainment. 3. "Cost of internet access" includes fixed broadband, wireless, and mobile internet access.
Sources: Activate analysis, eMarketer, GroupM, PricewaterhouseCoopers, ZenithOptimedia Group

In terms of consumer spending, subscriptions will add $141B in growth dollars and single transactions will add $46B

CONSUMER INTERNET AND MEDIA REVENUE[1] GROWTH BY REVENUE MODEL, GLOBAL, 2020E VS. 2024E, USD



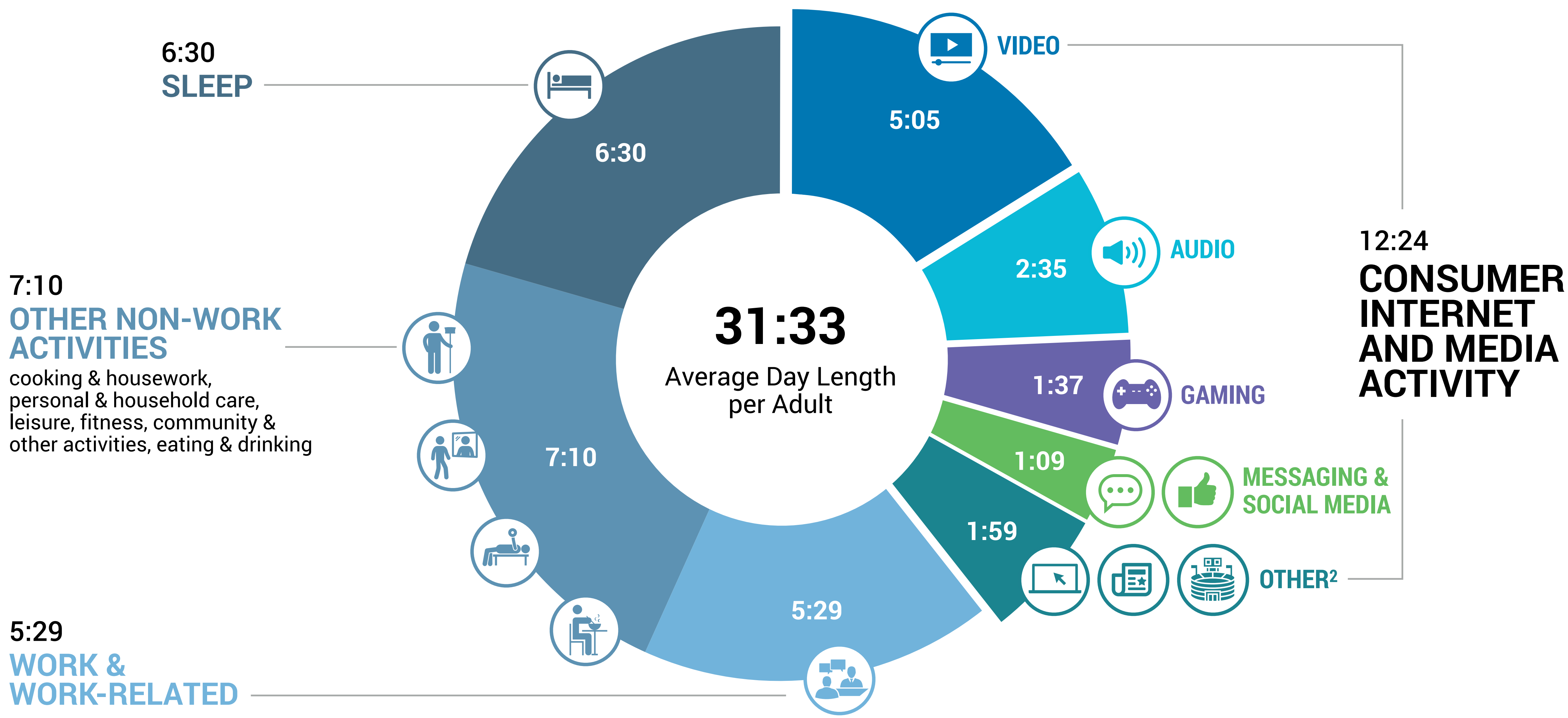
1. "Consumer internet and media revenues" include radio, recorded music, magazine publishing, newspaper publishing, video games, filmed entertainment, book publishing, TV subscription and licensing fees, and internet access.
Sources: Activate analysis, eMarketer, GroupM, Newzoo, Omdia, PricewaterhouseCoopers, ZenithOptimedia Group

CONTENTS

activate consulting
www.activate.com

Activate's analysis of technology and media activity shows that multitasking led to a 31.5-hour day for the average American in 2019, roughly 12.5 of which were spent using technology and media

AVERAGE DAY BY ACTIVITY PER ADULT AGED 18+[1], U.S., 2019, HOURS:MINUTES



1. Behaviors averaged over 7 days. Figures do not sum due to rounding. 2. "Other" includes media activities outside of the listed categories, such as browsing websites, reading, and attending live events.

Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), CareerBuilder, Edison Research, eMarketer, Gallup, Music Business Association, National Sleep Foundation, Nielsen, PricewaterhouseCoopers, U.S. Bureau of Labor Statistics, YouGov

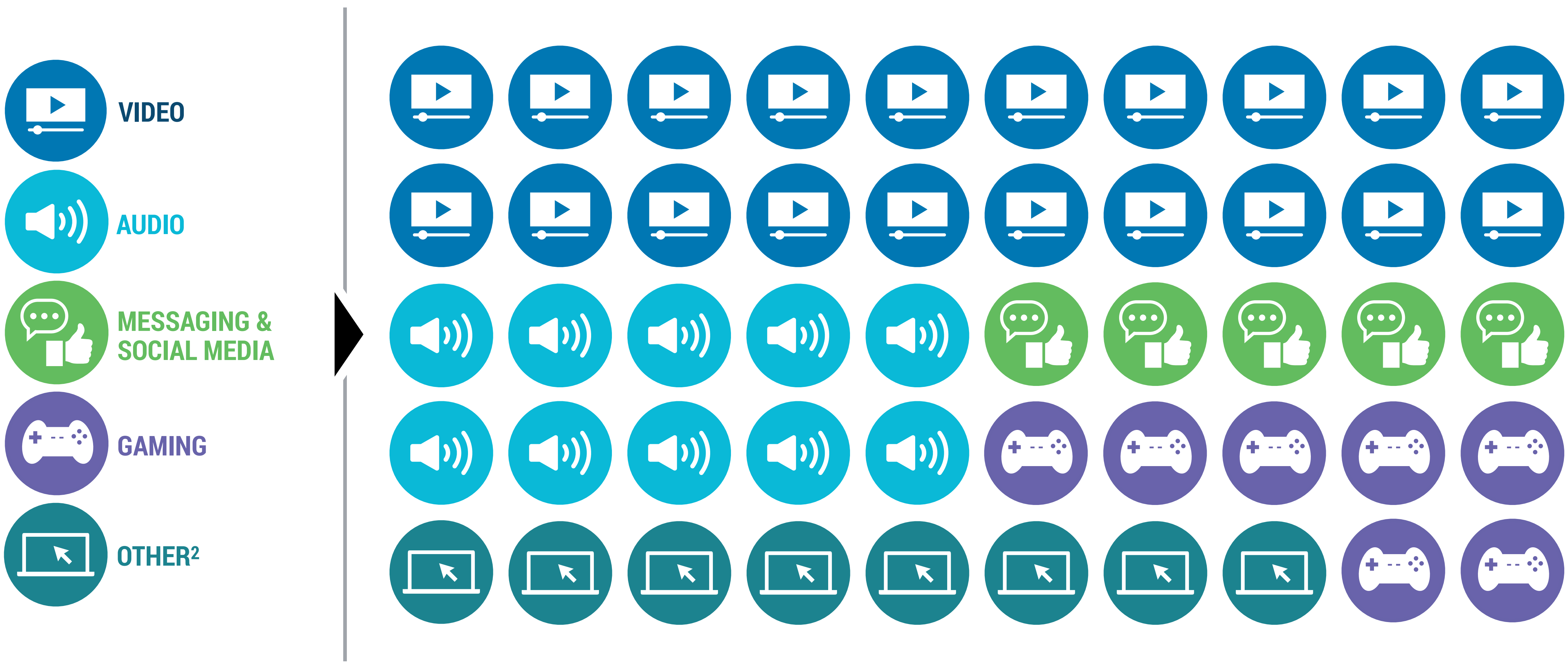
activate consulting

WSJ TECH LIVE

At 41% on average, video captures the largest share of the daily 12.5 hours spent with technology and media

AVERAGE DAILY INTERNET AND MEDIA ATTENTION PER ADULT AGED 18+[1], U.S., 2019, 15-MINUTE INTERVALS

AN AVERAGE 12.5-HOUR INTERNET AND MEDIA DAY IN 15-MINUTE INTERVALS

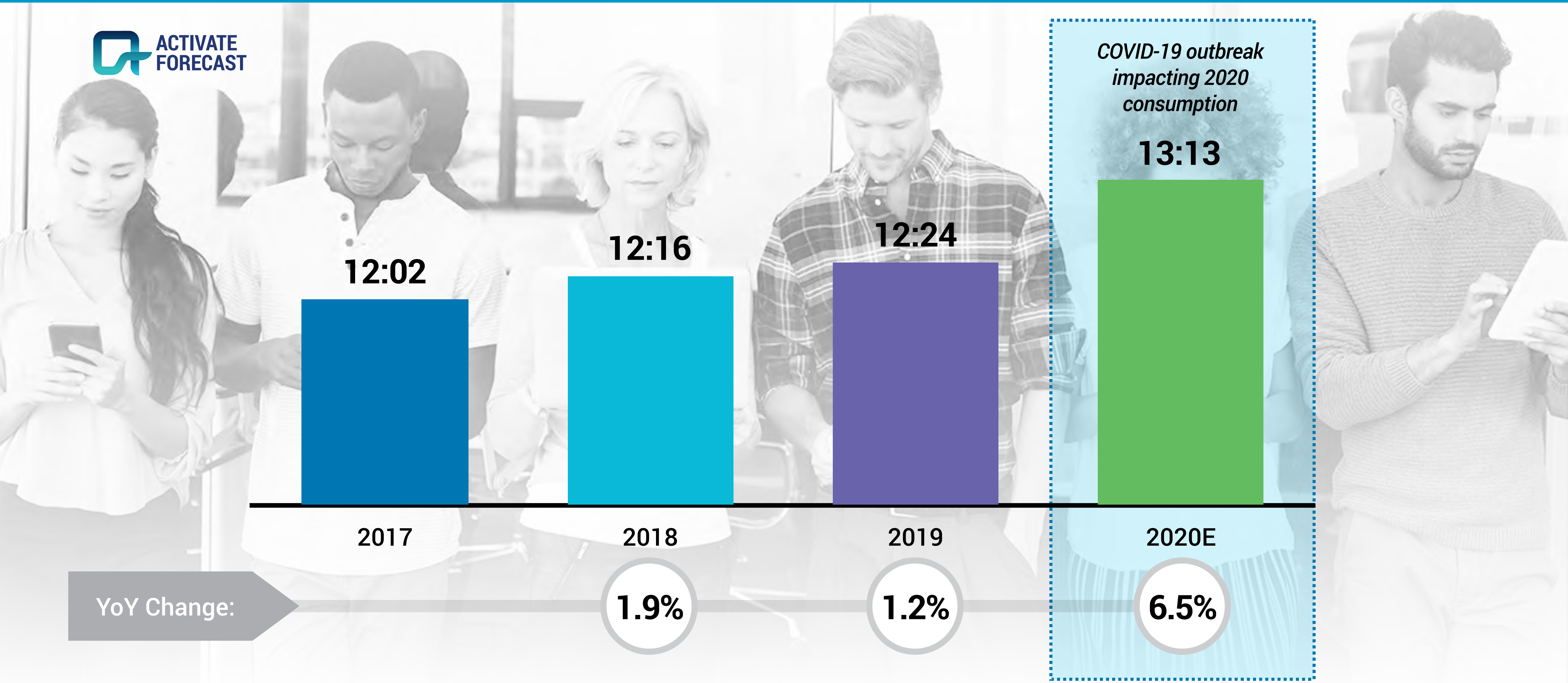


1. Behaviors averaged over 7 days.
2. "Other" includes media activities outside of the listed categories, such as browsing websites, reading, and attending live events.

Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Music Business Association, Nielsen, PricewaterhouseCoopers

Time spent with technology and media jumped after the COVID-19 outbreak – shifting the growth curve upwards for these industries

AVERAGE DAILY INTERNET AND MEDIA ATTENTION PER ADULT AGED 18+[1], U.S., 2017-2020E, HOURS:MINUTES

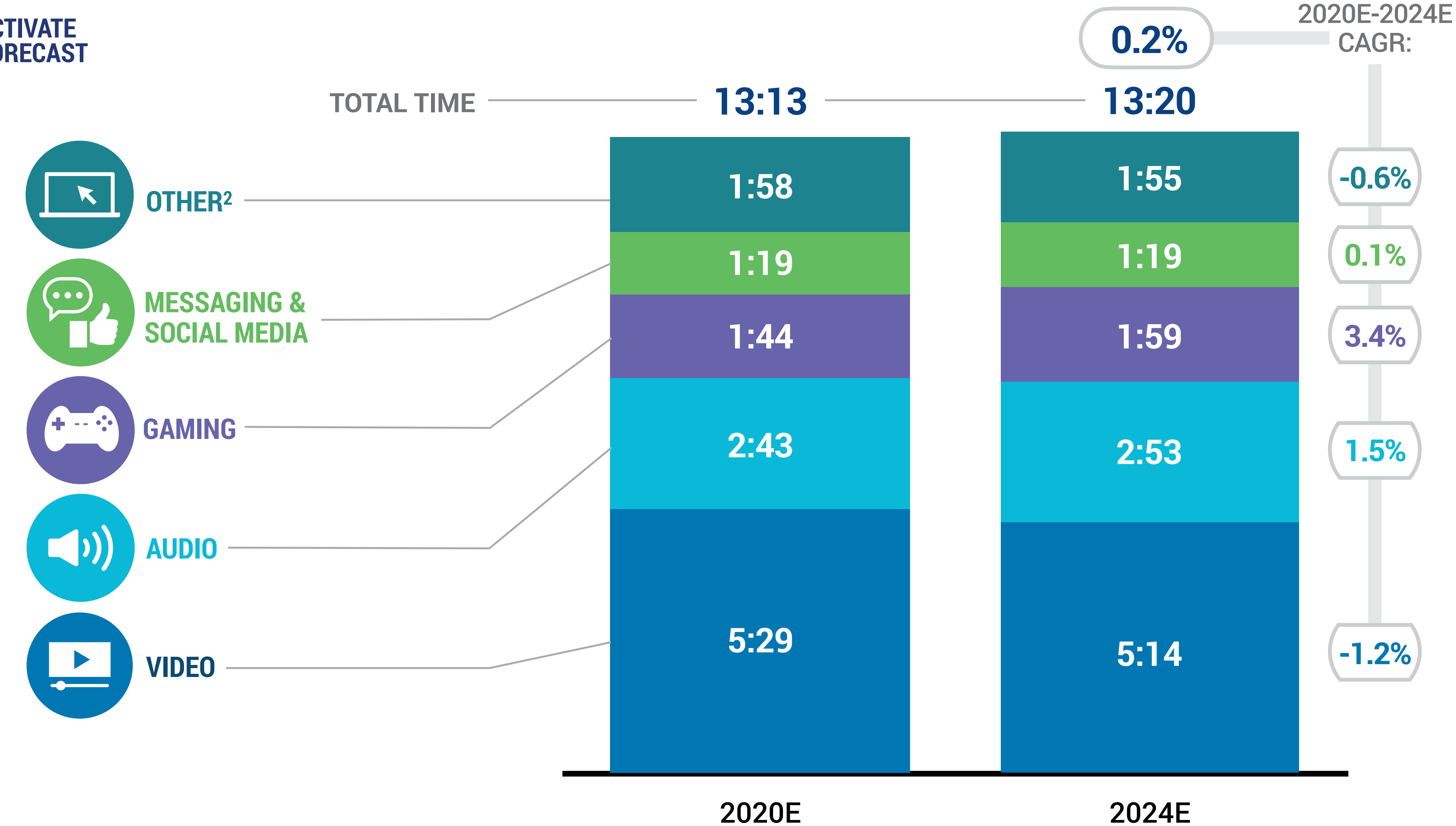


1. Behaviors averaged over 7 days.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Music Business Association, Nielsen, PricewaterhouseCoopers

Gaming will lead the growth in time spent with technology and media over the next 4 years

AVERAGE DAILY INTERNET AND MEDIA ATTENTION PER ADULT AGED 18+[1], U.S., 2020E VS. 2024E, HOURS:MINUTES

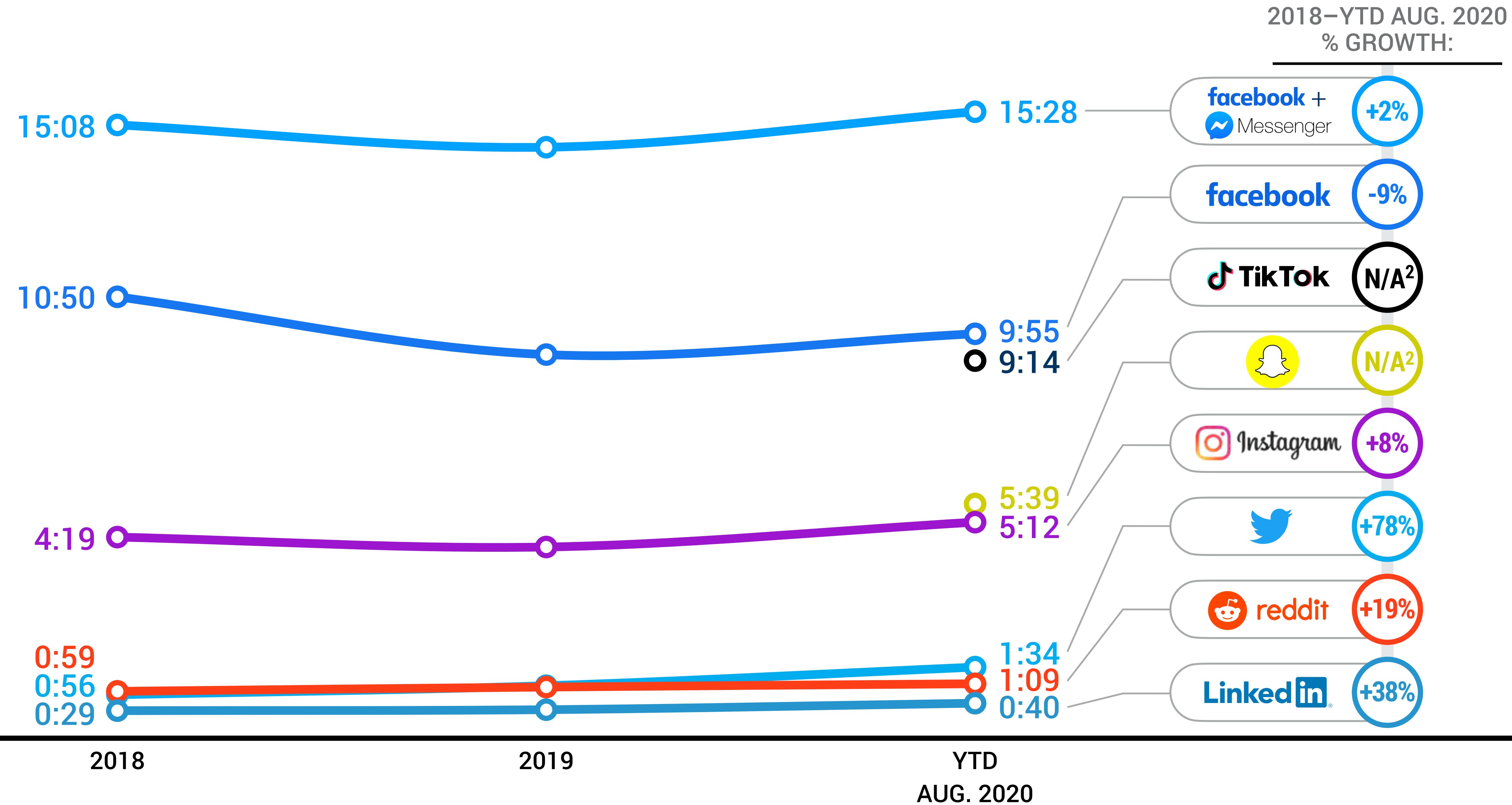
ACTIVATE FORECAST



1. Behaviors averaged over 7 days.
2. “Other” includes media activities outside of the listed categories, such as browsing websites, reading, and attending live events.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Music Business Association, Nielsen, PricewaterhouseCoopers

On average, time spent with most major social platforms has increased and TikTok's level of engagement is reaching parity with that of Facebook

AVERAGE MONTHLY TIME SPENT PER USER[1] ON DESKTOP, MOBILE WEB, AND APP BY SOCIAL PLATFORM,
U.S., 2018-YTD AUG. 2020, HOURS:MINUTES



1. Desktop users aged 2+ and mobile (i.e. smartphone, tablet) users aged 13+.
2. Prior year data is not available due to updated Comscore methodology.
Sources: Activate analysis, Comscore

CONTENTS

activate consulting
www.activate.com

To drive growth, technology and media companies need to identify, reach, and super-serve Super Users — a single group of power users whose time and spend far exceed those of other users

It is more critical than ever for technology and media companies to **understand and reach their most valuable consumers** — those who **engage more with media** and are **willing to pay** for the content and services that meet their needs

We have identified these consumers — **Super Users** — who account for a **disproportionately high share of time and spend** across all activities, including video, gaming, music, podcasts, messaging and social media, virtual reality, and eCommerce

To best reach Super Users and capture their time and spend, technology and media companies will need to create **personalized offerings that cater to their broad set of interests**

Making up less than 25% of all users, Super Users account for a much higher share of consumption and spend across technology, media, and eCommerce activities

MEDIA TIME SPEND

Super Users spend

1.4X

as much time consuming media[1] as all other users

MEDIA DOLLAR SPEND

Super Users spend

3.6X

as much on media purchases[2] as all other users

ECOMMERCE DOLLAR SPEND

Super Users spend

5.0X

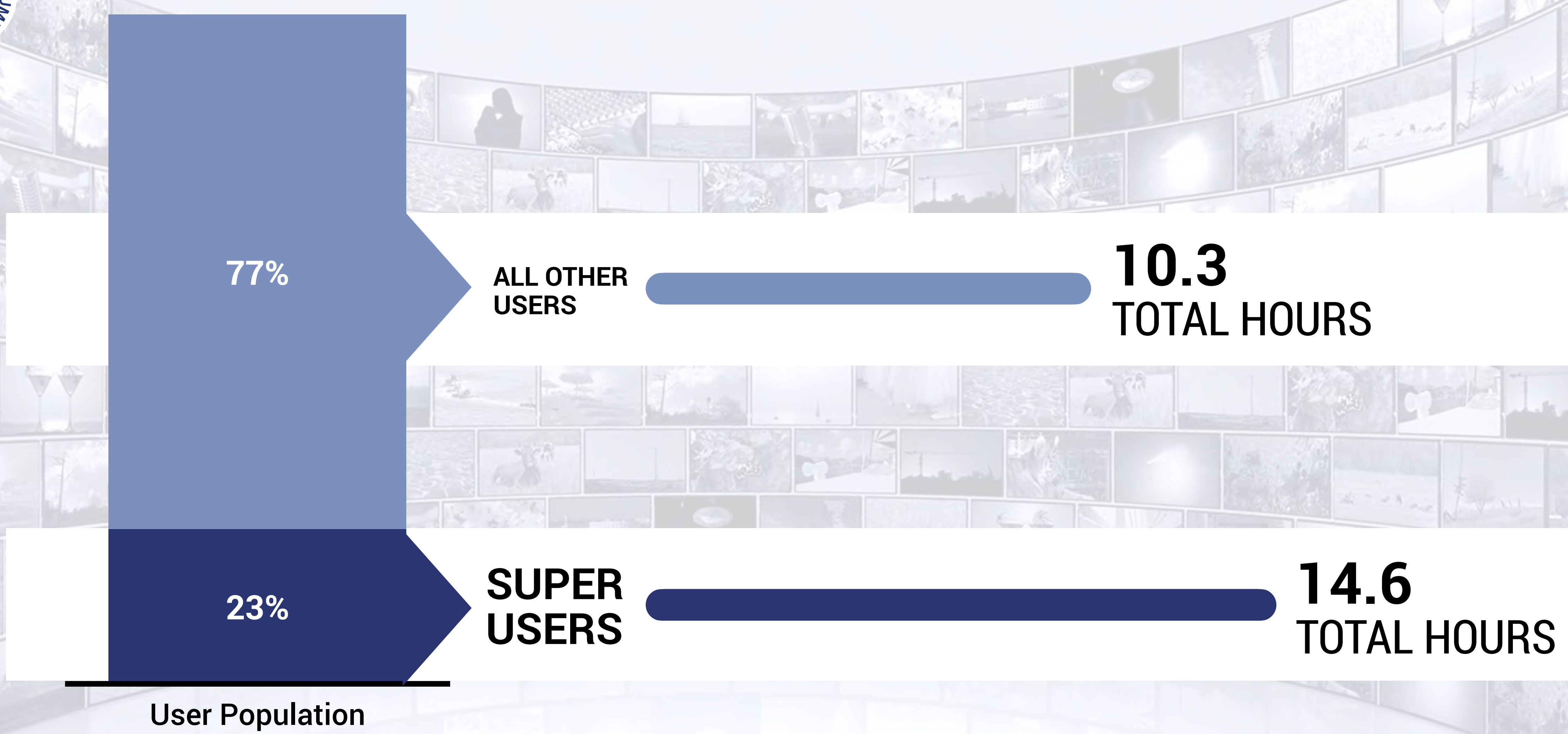
as much on eCommerce purchases as all other users

1. Includes time spent watching video, playing video games, listening to music, listening to podcasts, and using messaging / social media services. 2. Includes money spent on all videos and video services, including traditional/virtual Pay TV, video streaming services, and from video stores / rental services; money spent on video games and other video gaming purchases (e.g. in-app purchases) across all devices; and money spent on music, music services, podcasts, and podcast services (excluding donations).

Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Super Users spend more time with technology and media than all other users, with their average day including 4 additional hours of consumption

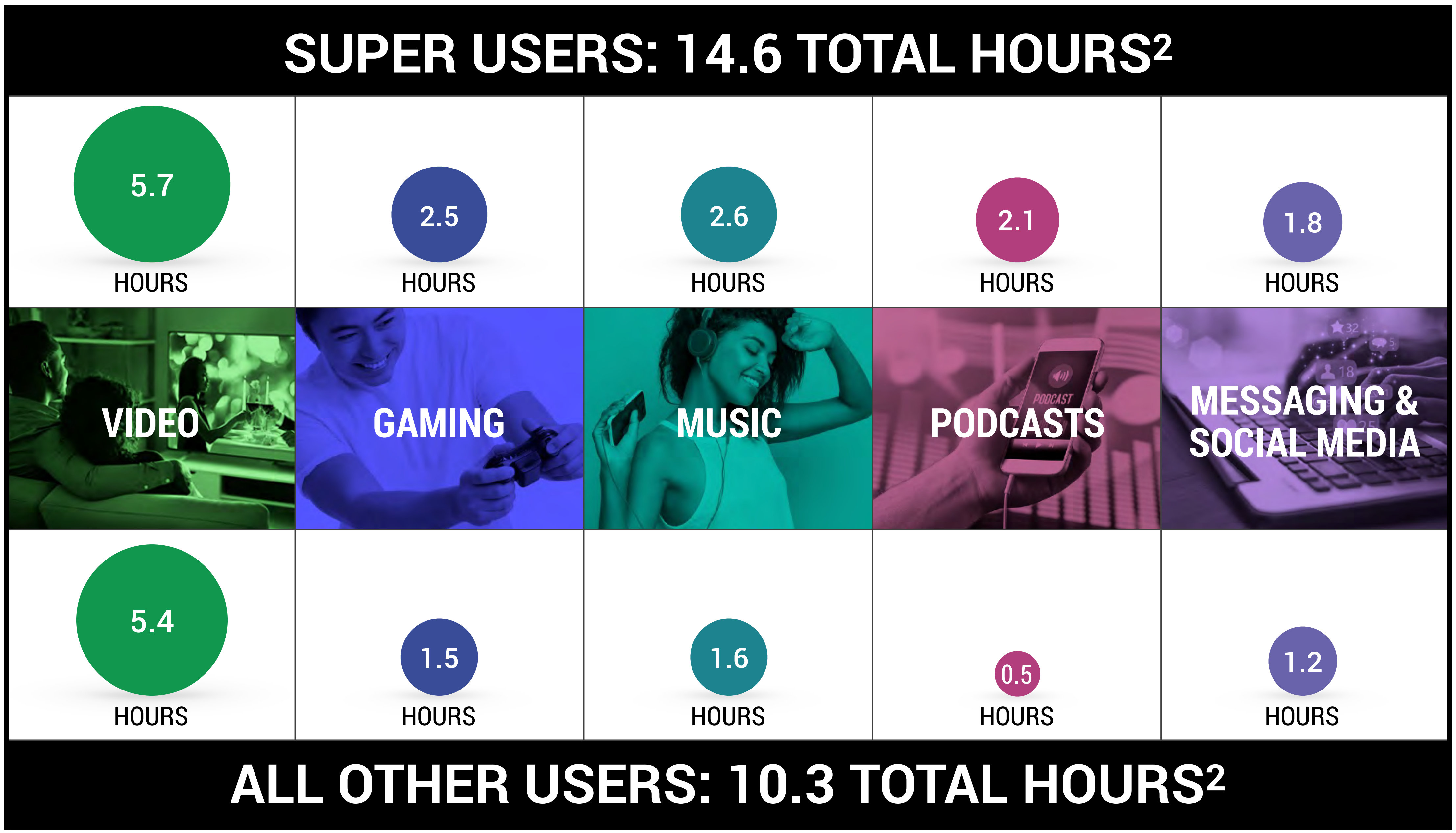
AVERAGE DAILY TIME SPENT WITH MEDIA PER USER[1], U.S., 2020, % ADULTS AGED 18+ / HOURS PER DAY



1. Includes time spent watching video, playing video games, listening to music, listening to podcasts, and using messaging / social media services. Does not account for multitasking.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Music Business Association, Nielsen, PricewaterhouseCoopers

Super Users spend more time with all major technology and media activities – video, gaming, music, podcasts, and messaging / social media

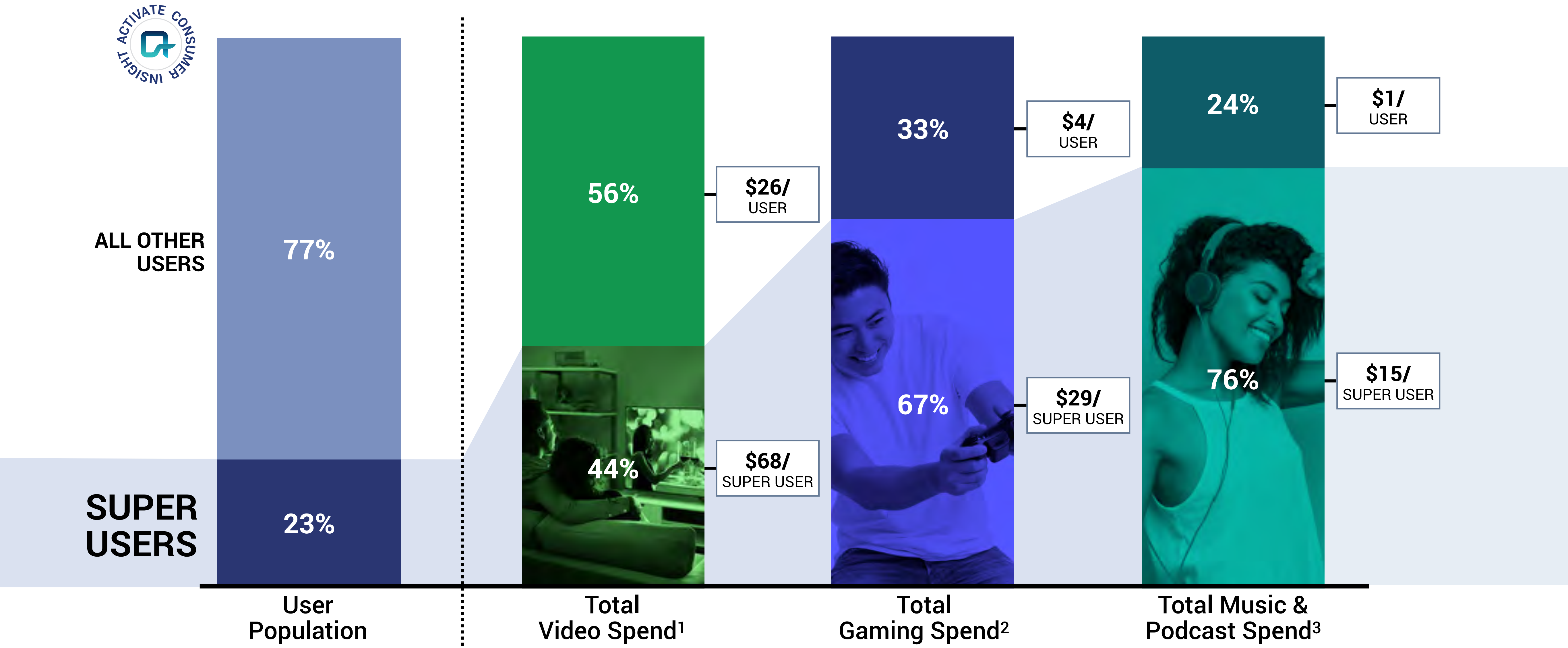
AVERAGE DAILY TIME PER USER BY MEDIA TYPE[1], U.S., 2020, HOURS PER DAY



1. Figures do not sum due to rounding. 2. "Total hours" do not account for multitasking.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Music Business Association, Nielsen, PricewaterhouseCoopers

Not only do Super Users spend more time with technology and media, they also spend more money

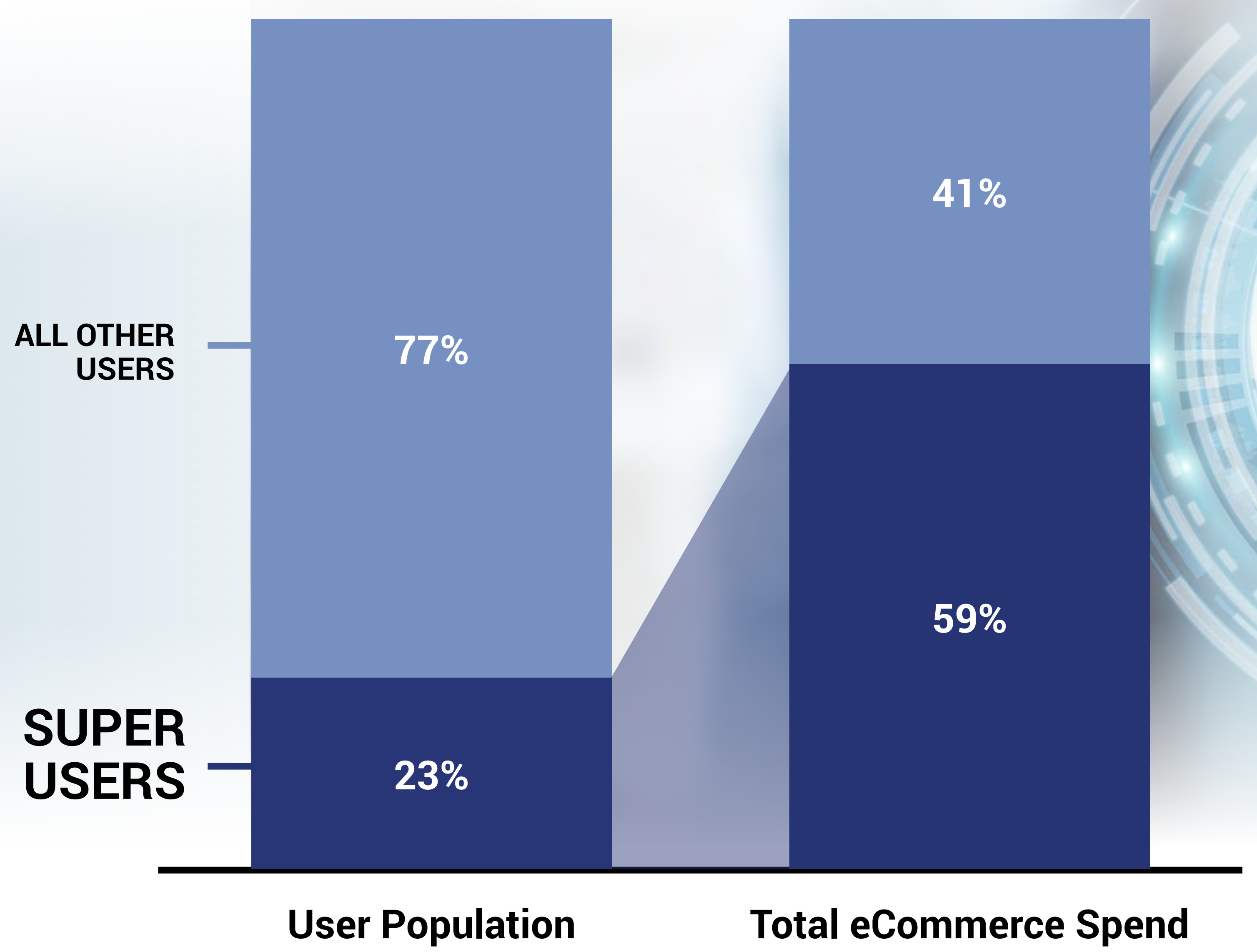
MONTHLY DOLLAR SPEND BY MEDIA TYPE,
U.S., 2020, % ADULTS AGED 18+ / % TOTAL SPEND BY MEDIA TYPE / USD PER USER



1. Includes money spent on all videos and video services, including traditional/virtual Pay TV, video streaming services, and from video stores / rental services. 2. Includes money spent on video games and other video gaming purchases (e.g. in-app purchases) across all devices. 3. Includes money spent on music, music services, podcasts, and podcast services (excluding donations).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Newzoo, PricewaterhouseCoopers, Statista, U.S. Census Bureau

Super Users' technology and media behavior extends to eCommerce, in which they account for the bulk of total spend

ECOMMERCE SPEND, U.S., 2020, % ADULTS AGED 18+ / % TOTAL ECOMMERCE SPEND



Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

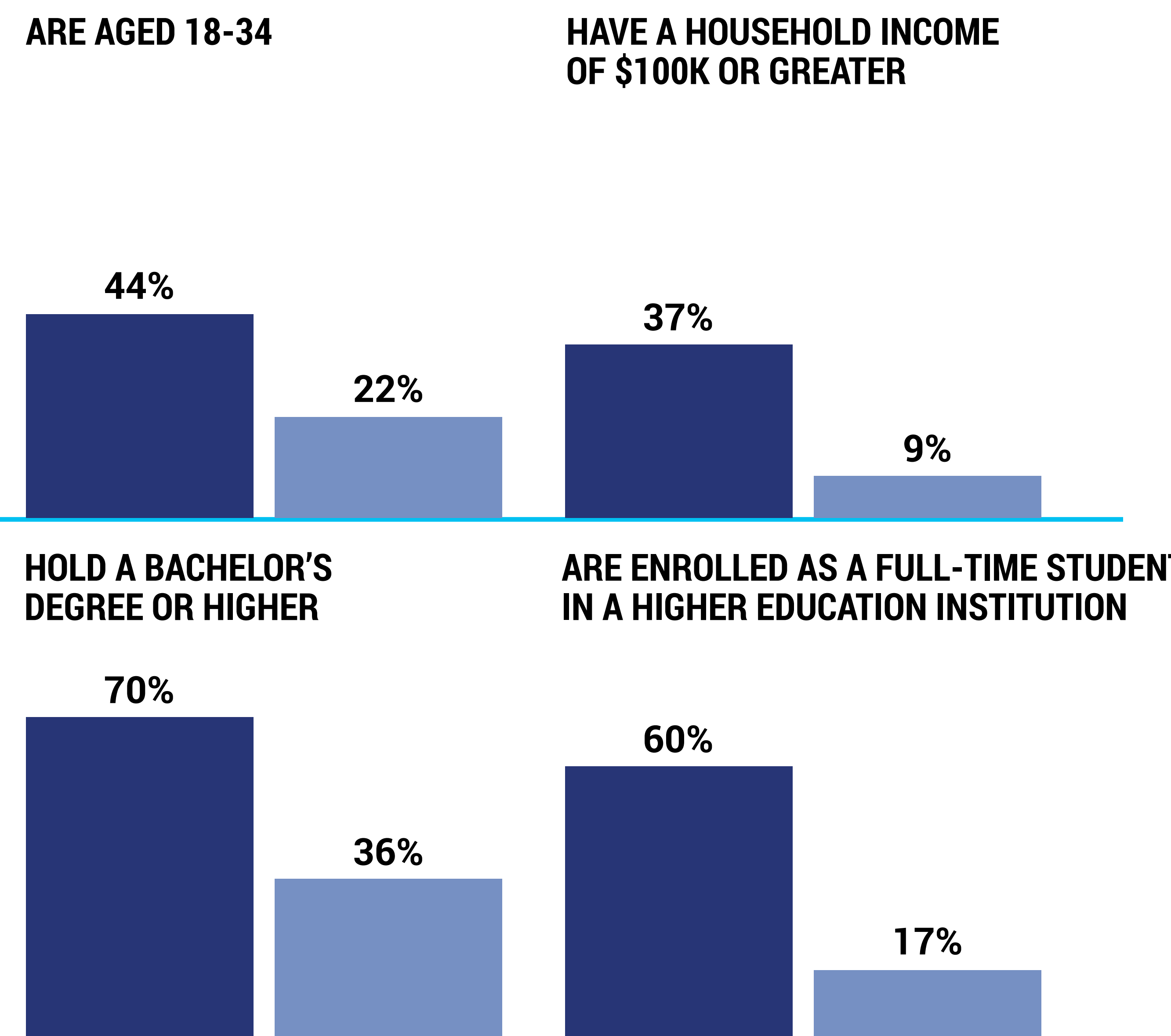
Super Users are younger and more affluent, with a higher level of education than all other users

USER DEMOGRAPHICS, U.S., 2020, % ADULTS AGED 18+

Super Users   All Other Users

Super Users tend to be **younger** and **more affluent** than their counterparts, making them **more valuable** to technology and media companies

Super Users are **highly educated**, with most holding a **college degree** and many still **enrolled as full-time students** in a higher education institution



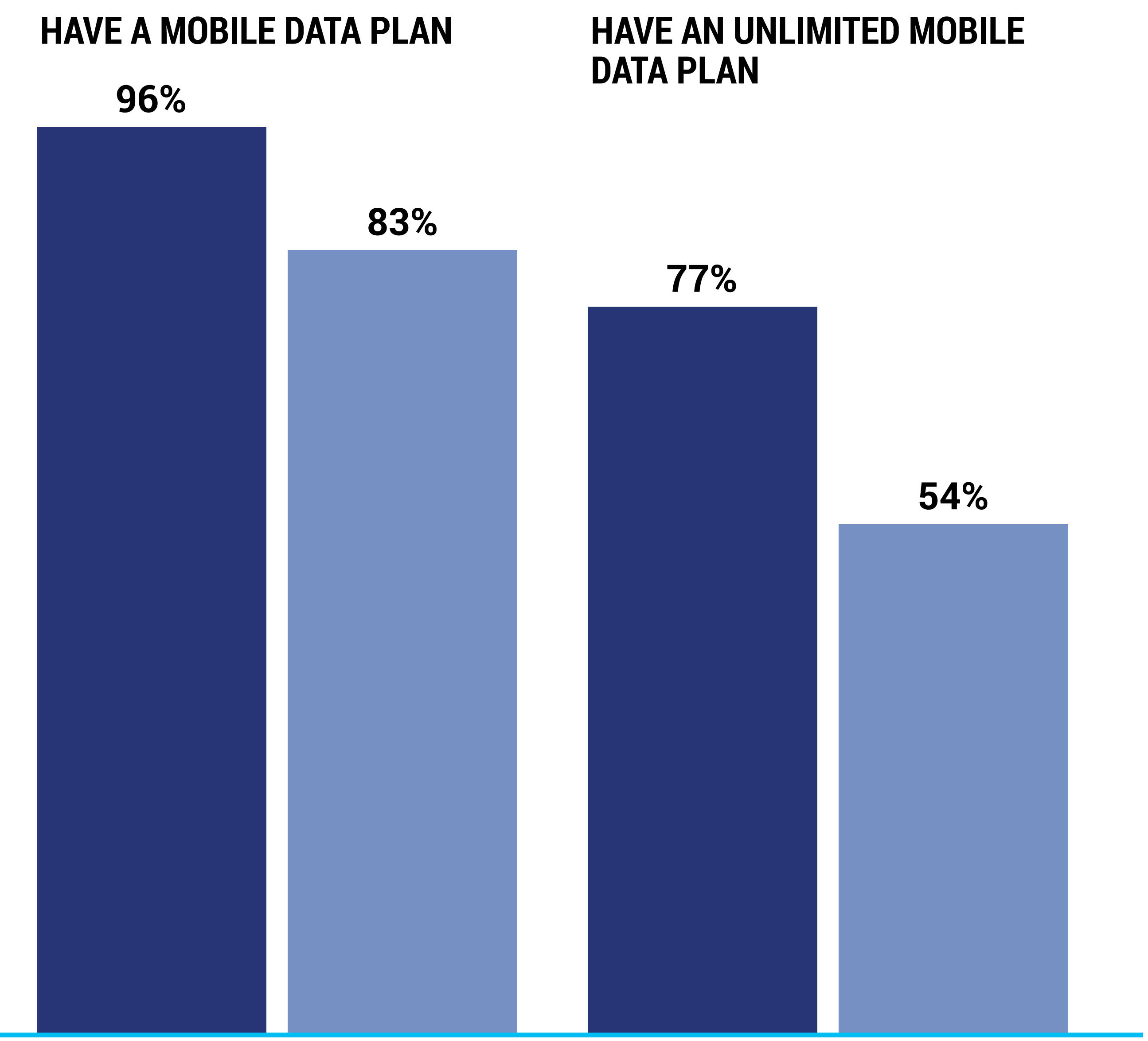
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Super Users are highly connected, with most having access to unlimited mobile data

MOBILE DATA PLAN ACCESS, U.S., 2020, % ADULTS AGED 18+

Super Users All Other Users

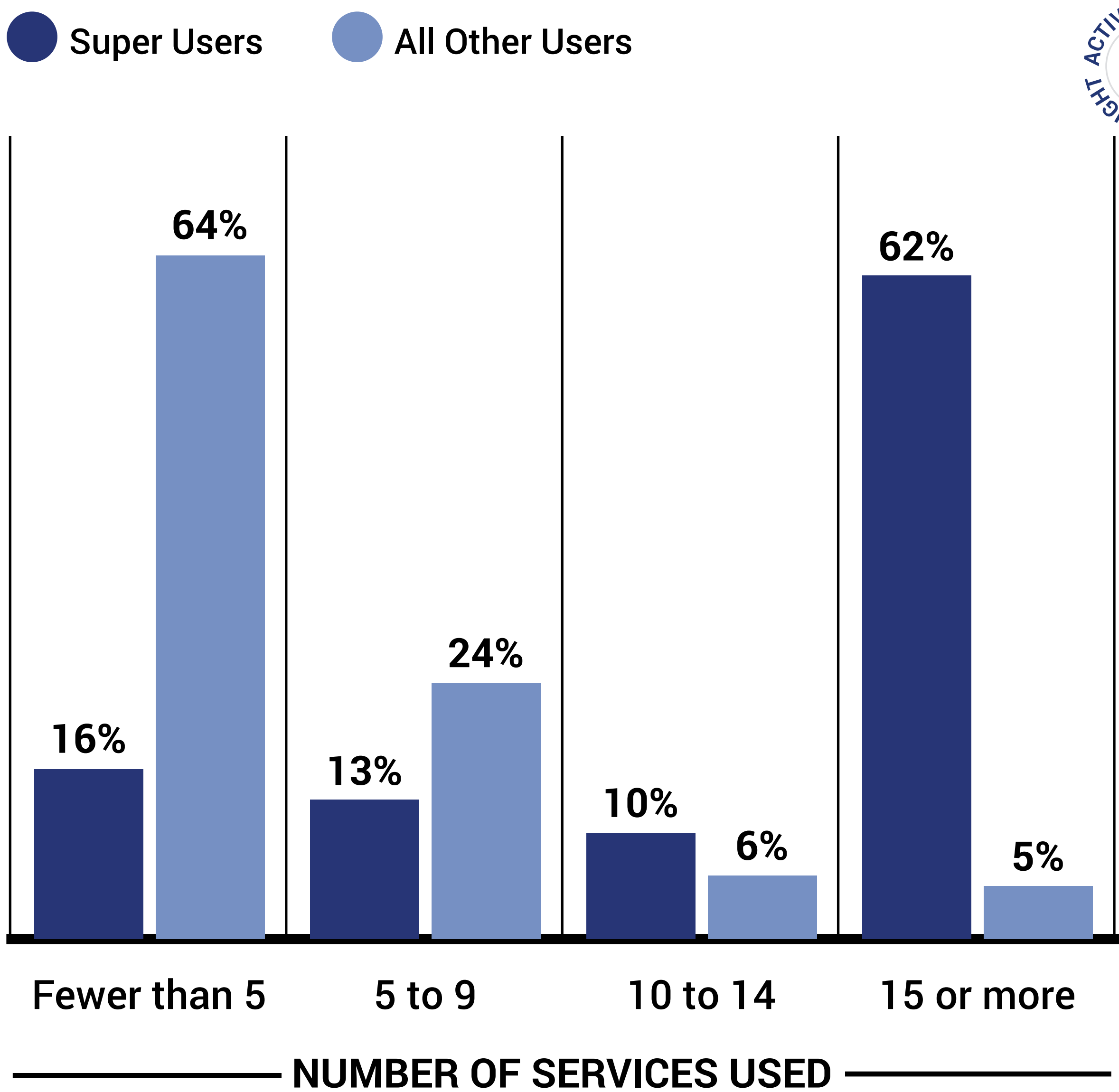
Nearly **all Super Users** have a **mobile data plan**, and most have **unlimited data**, allowing them to **consume as much content as they want** on their mobile devices



Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

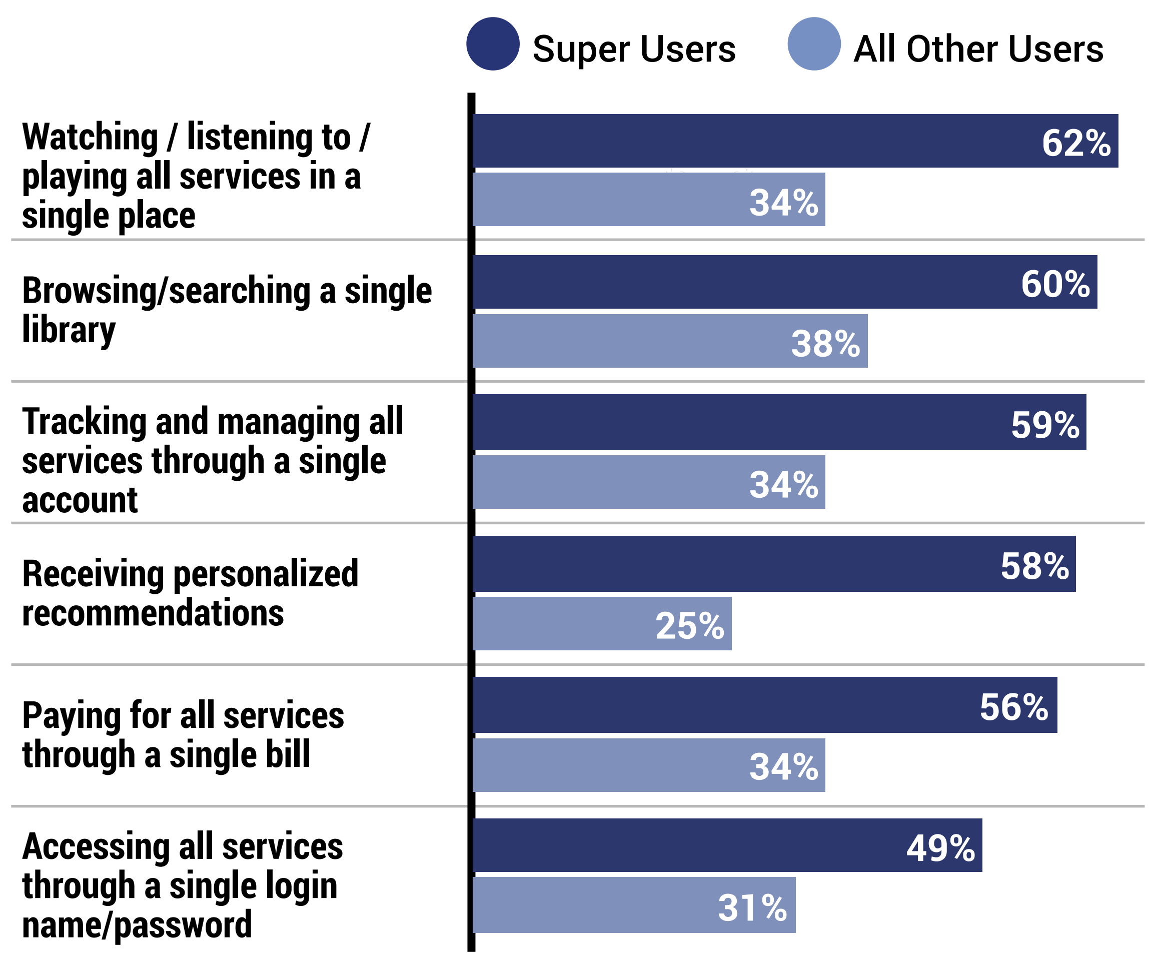
Super Users are searching for a more unified consumption experience that can accommodate the higher number of streaming services they use

NUMBER OF DIGITAL MEDIA SERVICES USED PER USER[1], U.S., 2020, % ADULTS AGED 18+



MOST IMPORTANT FEATURES WHEN USING MULTIPLE DIGITAL MEDIA SERVICES, U.S., 2020, % ADULTS AGED 18+

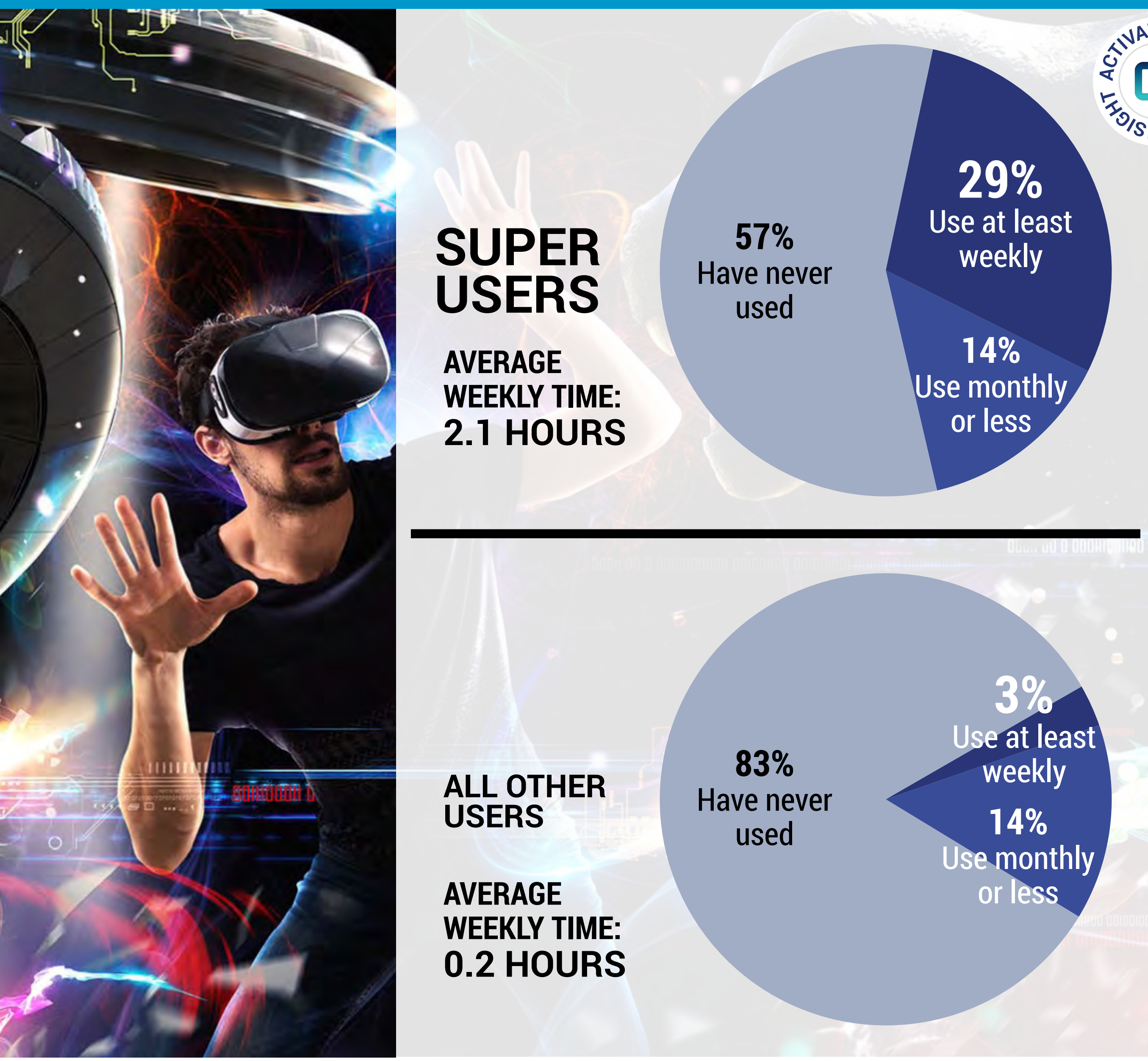
Super Users place more importance on features and capabilities that create a seamless and personalized experience



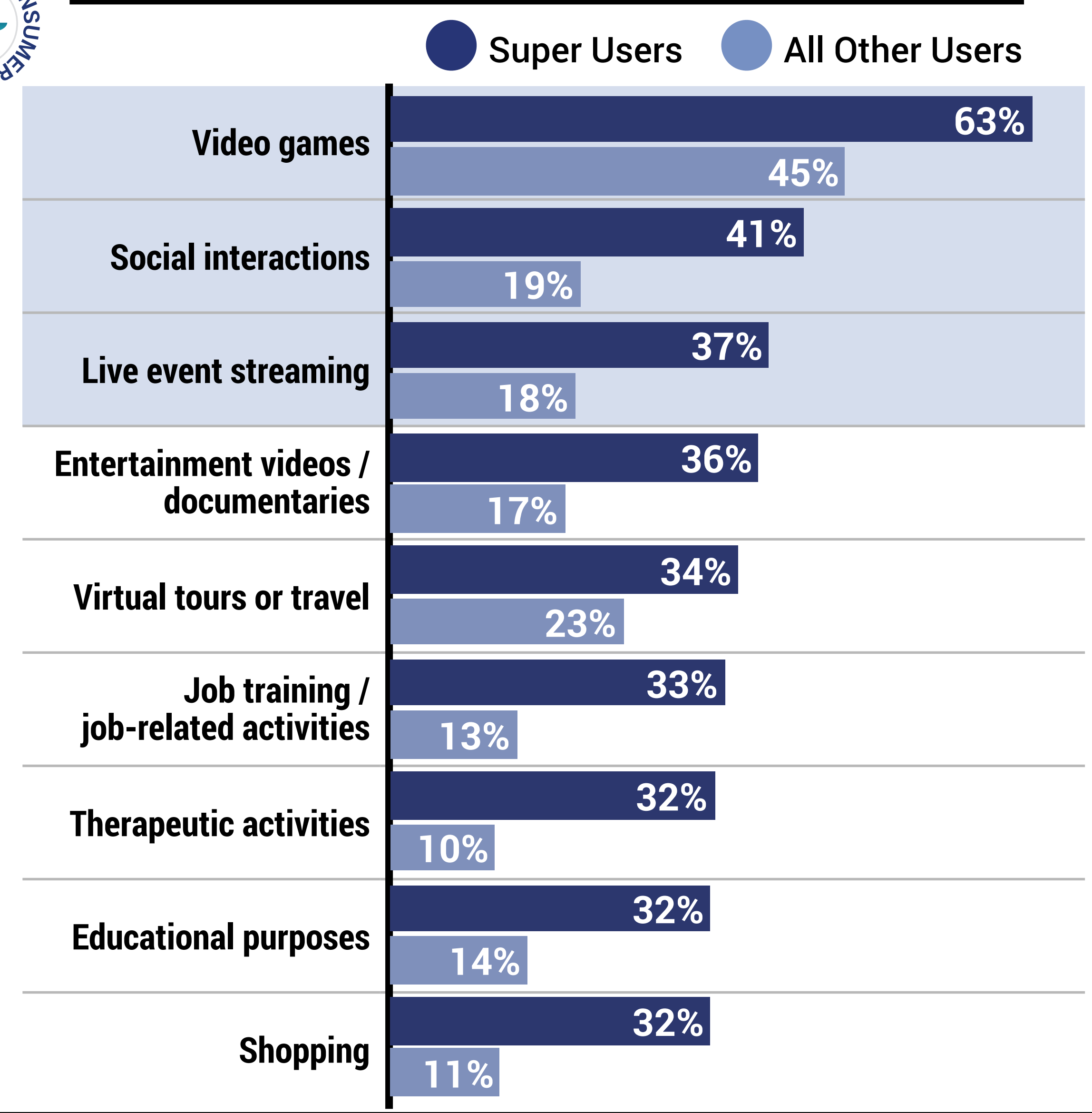
1. Includes video streaming services, video game subscriptions, cloud gaming services, music streaming services, and podcast services. Figures do not sum to 100% due to rounding.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Super Users are turning to immersive media, such as virtual reality, as a substitute for live events and other social experiences

VIRTUAL REALITY USAGE, U.S., 2020, % ADULTS AGED 18+



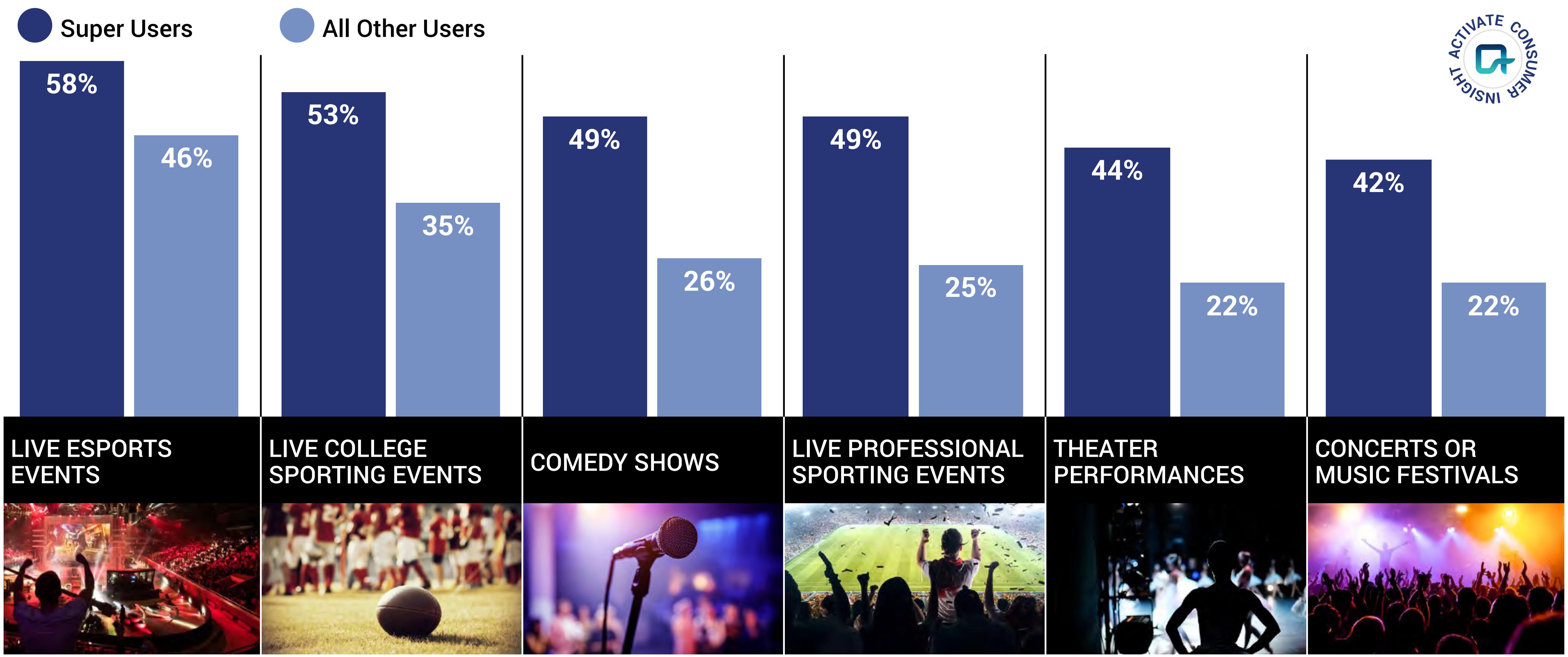
REASONS FOR PURCHASING A VIRTUAL REALITY HEADSET, U.S., 2020, % VIRTUAL REALITY HEADSET PURCHASERS AGED 18+



Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Super Users will lead the charge back to live events when they fully return

INTENT TO ATTEND MORE LIVE EVENTS[1] AFTER THE COVID-19 OUTBREAK[2] THAN IN 2019 AMONG EVENT ATTENDEES,
U.S., 2020, % 2019 LIVE EVENT ATTENDEES AGED 18+ BY EVENT TYPE



AVERAGE NUMBER OF LIVE EVENTS[1] ATTENDED IN 2019 AMONG EVENT ATTENDEES BY TYPE

	Live Esports Events	Live College Sporting Events	Comedy Shows	Live Professional Sporting Events	Theater Performances	Concerts or Music Festivals
Super Users	4.5	4.2	3.4	4.1	3.4	3.2
All Other Users	1.3	1.6	1.4	1.7	1.6	1.7

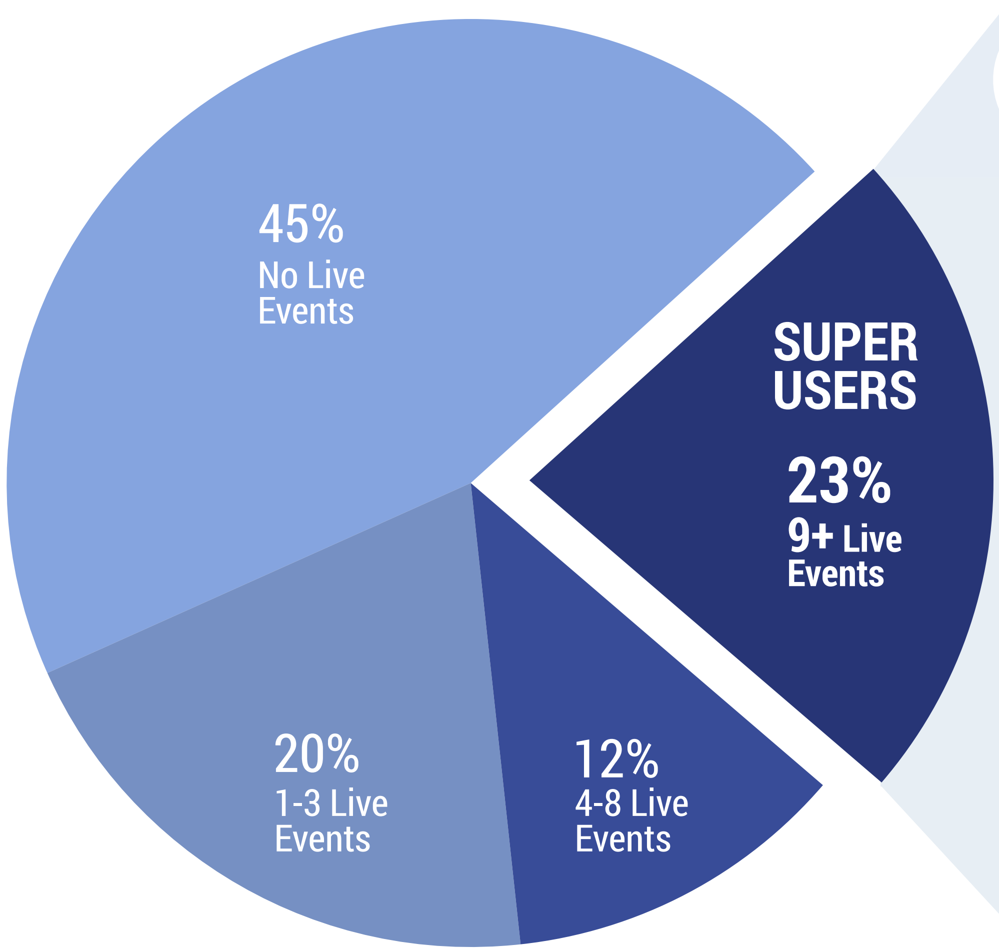
activate consulting

1. Refers to live events in large venues (e.g. theaters, stadiums, festival grounds). 2. "After the COVID-19 outbreak" refers to the 12-month period after the end of the COVID-19 outbreak and subsequent social distancing measures.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

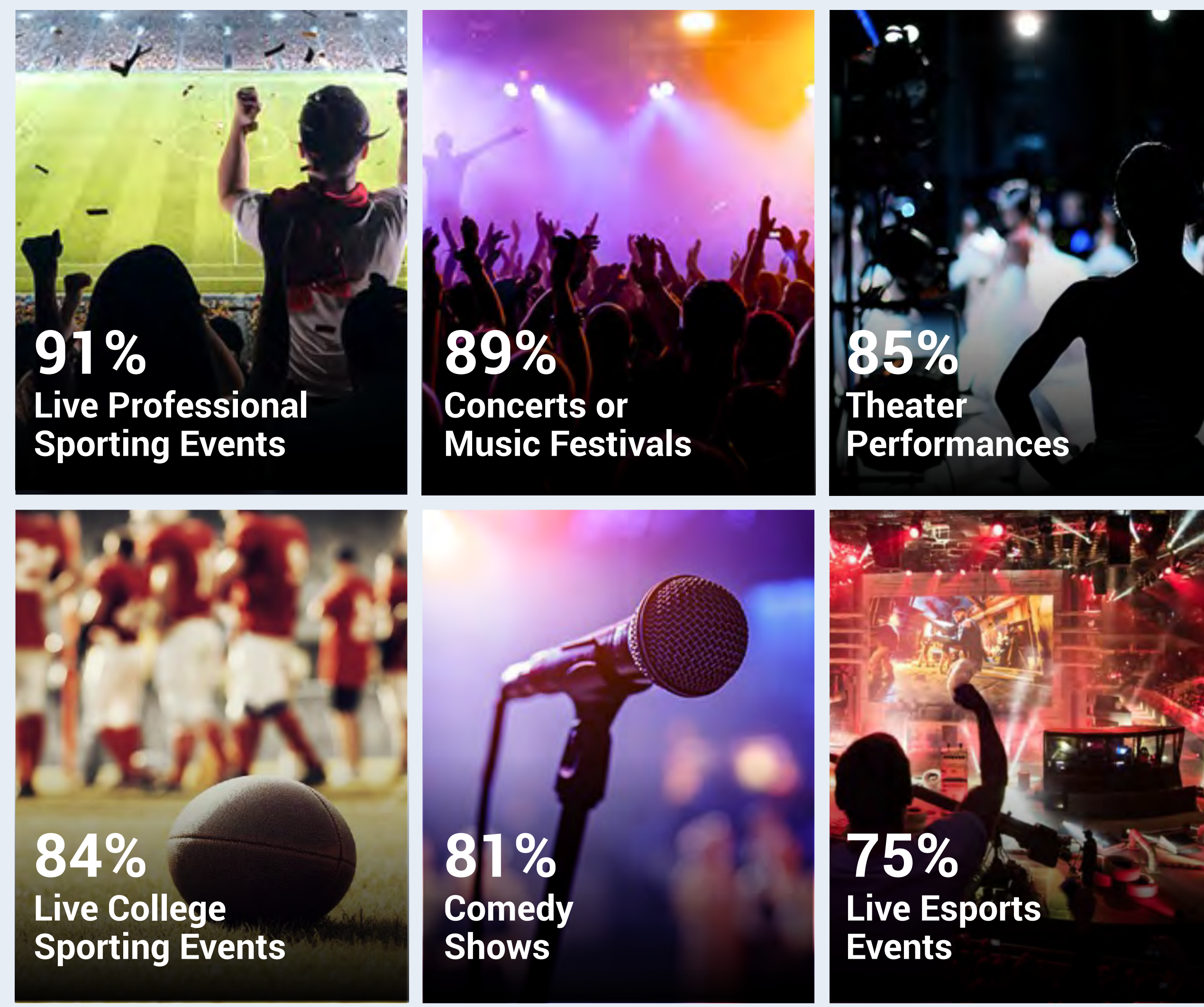
WSJ TECH LIVE

Super Users are also defined by their high level of live event attendance prior to the COVID-19 outbreak

NUMBER OF LIVE EVENTS[1] ATTENDED PER USER, U.S., 2019, % ADULTS AGED 18+



LIVE EVENT[1] ATTENDANCE BY EVENT TYPE, U.S., 2019, % SUPER USERS



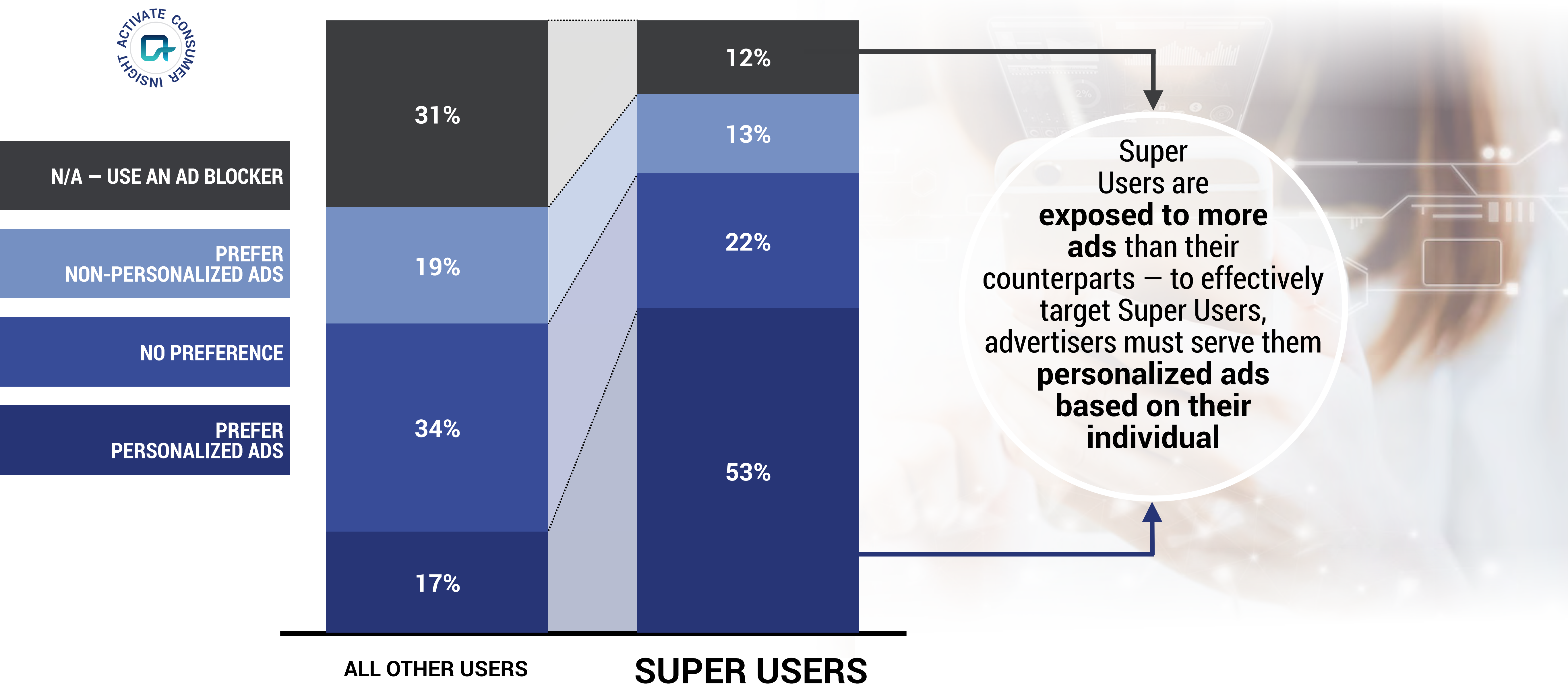
activate consulting

1. Refers to live events in large venues (e.g. theaters, stadiums, festival grounds).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

WSJ TECH LIVE

It will be essential for technology and media businesses to capture more of these Super Users — in order to reach them, companies will need to deploy a highly personalized approach that caters to their interests

PREFERENCE FOR AD PERSONALIZATION[1], U.S., 2020, % ADULTS AGED 18+



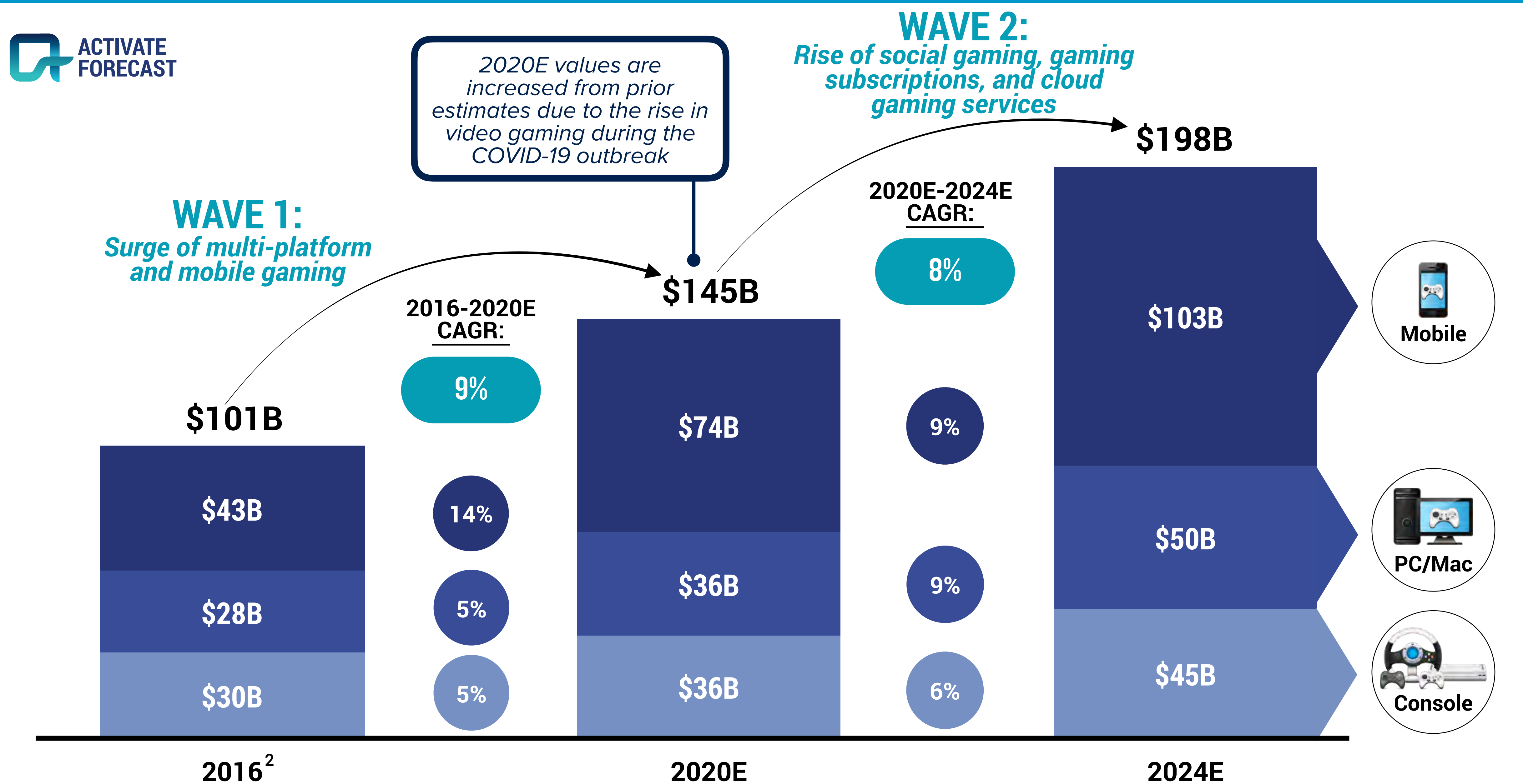
1. Figures do not sum to 100% due to rounding.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer

CONTENTS

activate
consulting
www.activate.com

We project sustained growth for the video game industry across all major platforms

CONSUMER VIDEO GAME REVENUE BY PLATFORM[1], GLOBAL, 2016 VS. 2020E VS. 2024E, BILLIONS USD



1. Excludes hardware and device sales, augmented reality / virtual reality, and advertising. Figures do not sum due to rounding.
2. 2016 values are revised from previous estimates based on an updated methodology.
Sources: Activate analysis, Newzoo, PricewaterhouseCoopers

Gaming is the new technology paradigm, fundamentally reshaping the order and power structure in technology

- Gaming's importance will be significantly larger than its already outsized financial weight
- Similar to previous waves of digital technology (e.g. search, social, eCommerce, mobile, apps, messaging), gaming will fundamentally change how people interact with each other and the internet overall
- Most digital activities (e.g. search, social, shopping, live events) will increasingly take place *inside* of games
- The battle for gaming will intensify between the major technology platforms, leading to a new wave of mergers and technology investments

Source: Activate analysis

Video games are creating a virtual shared space where all digital activities will take place

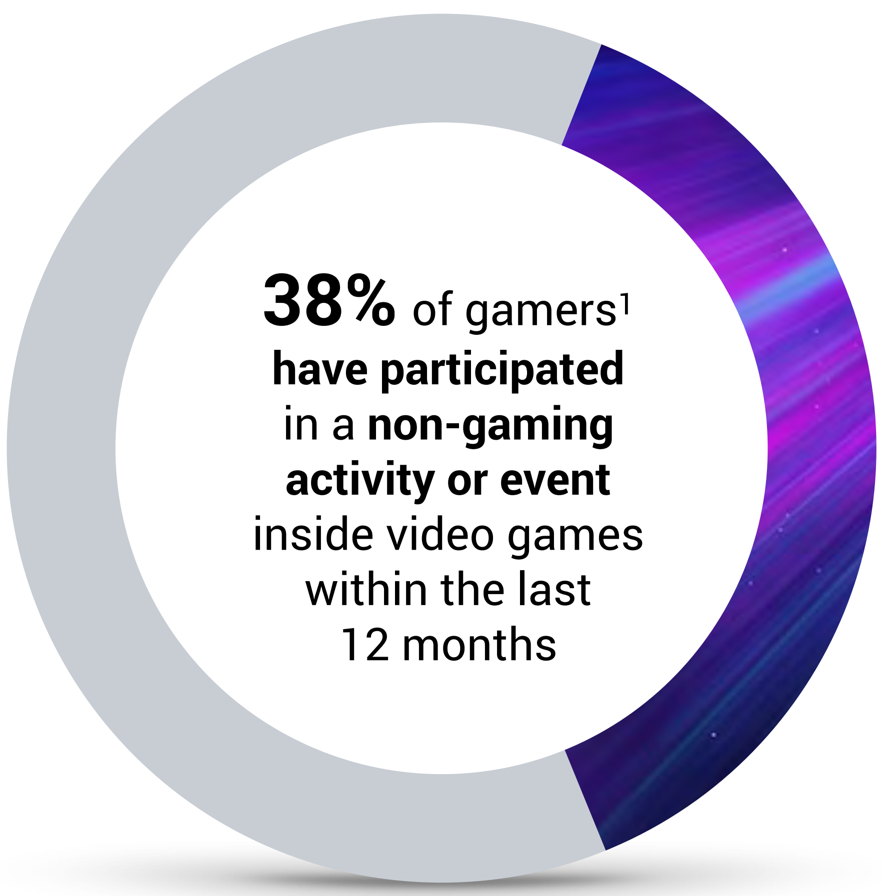
Source: Activate analysis

Gaming is becoming the central hub for people's virtual lives, and increasingly their real lives

Sources: Activate analysis, Company sites, The Daily Californian, Esports Insider, iRacing, SlashGear, South China Morning Post, The Verge, WHYY

Gamers will participate in social activities and events within video games that extend beyond gameplay

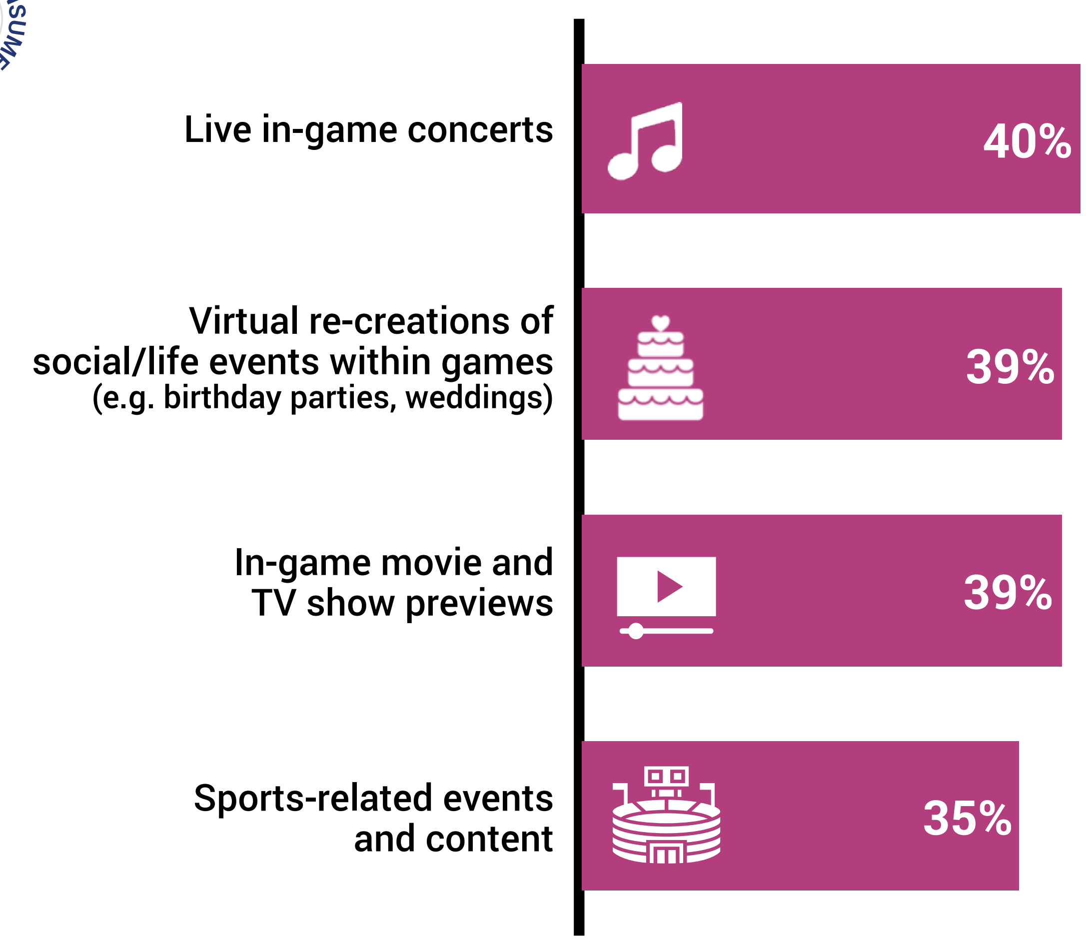
PARTICIPATION IN NON-GAMING ACTIVITIES OR EVENTS IN VIDEO GAMES WITHIN THE LAST 12 MONTHS,
U.S., 2020, % GAMERS[1]



PARTICIPATION IN NON-GAMING ACTIVITIES OR EVENTS IN VIDEO GAMES WITHIN THE LAST 12 MONTHS BY TYPE,
U.S., 2020, % GAMERS[1] WHO HAVE PARTICIPATED IN A NON-GAMING ACTIVITY OR EVENT IN THE LAST 12 MONTHS

ACTIVATE CONSUMER INSIGHT

AMONG GAMERS[1] WHO HAVE PARTICIPATED IN A NON-GAMING ACTIVITY OR EVENT IN THE LAST YEAR, THE TOP ACTIVITY WAS ATTENDING LIVE IN-GAME CONCERTS



activate consulting

1. "Gamers" are defined as adults 18+ who currently play video games.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

WSJ TECH LIVE

Gaming is where culture will be created and set — evolving into a deeply social behavior with a new set of digital experiences and functionality

GAMING ENABLES PLAYERS TO ENGAGE AND INTERACT IN CREATIVE WAYS

	IN-GAME SOCIAL BEHAVIORS	EXAMPLE GAMES	
LOCATIONS FOR **GATHERING**	• Birthday parties • Weddings • Meetings • Private events		
OPPORTUNITIES FOR **SELF-EXPRESSION**	• Personalization of digital avatars (e.g. fashion/ skins, dances/emotes)		
USER-GENERATED WORLDS & ENVIRONMENTS	• Customized locations to design and share within games		

activate consulting

Sources: Activate analysis, Company sites, TechCrunch, The Washington Post

WSJ TECH LIVE

All of the top titles feature online multiplayer gameplay

TOP-EARNING PAID PC AND CONSOLE VIDEO GAME TITLES, GLOBAL, 2019, MILLIONS USD

PLAYSTATION XBOX PERSONAL COMPUTER NINTENDO SWITCH

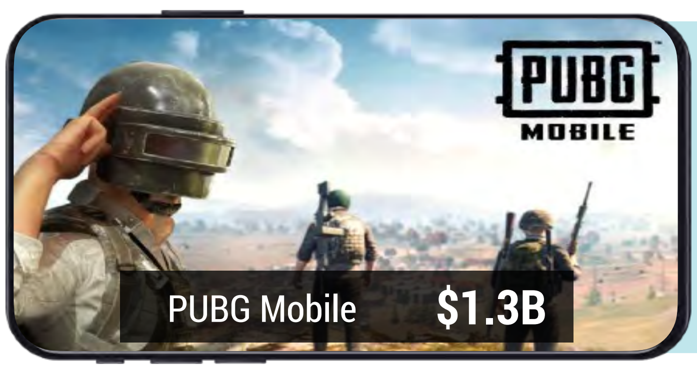
Sources: Activate analysis, Company sites, SuperData

Top mobile games provide unique opportunities for players to connect with their friends and the gaming community

TOP-EARNING MOBILE GAME TITLES[1,2], GLOBAL[3], 2019, BILLIONS USD

TOP MOBILE[2] GAMES ALLOW PLAYERS TO INTERACT WITH FRIENDS THROUGH GAMEPLAY

Ability to compete against one another in teams made up of friends or strangers



Ability to play in matches and communicate with friends through messaging and voice chat

Ability to gain points by interacting with friends

Ability to compare scores and records with friends

Ability to trade Pokémon, battle with friends, and send gifts

Ability to play co-op with up to three other players

1. App stores analyzed include Google Play and App Store (iOS), and do not include third-party app stores. Candy Crush Saga includes PC revenues. 2. "Mobile" is defined as smartphones and tablets. 3. All earnings are global except for Monster Strike which is earnings in Japan. 4. Also includes revenue from Arena of Valor. 5. Estimated earnings in Japan of 102B JPY. Earnings have been converted from JPY to USD with the yearly average currency exchange rate for 2019 as defined by the IRS.
Sources: Activate analysis, Company filings, Daily Esports, Game-i, Sensor Tower, SuperData

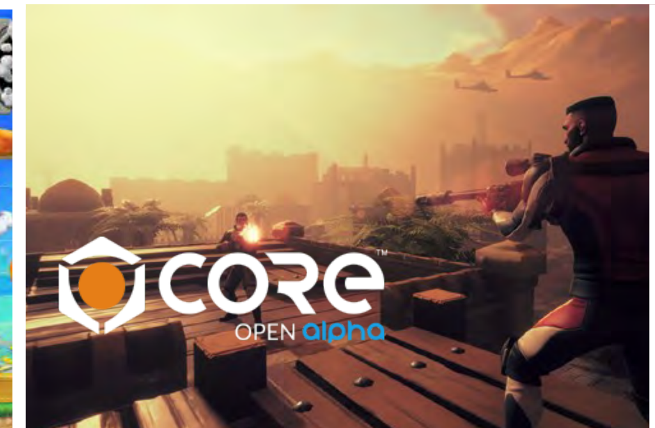
Game creation is also becoming a widespread social activity – players design worlds and share experiences with their friends

GAME CREATION ENGINES ARE ENABLING GAMERS AND DEVELOPERS TO DESIGN THEIR OWN EXPERIENCES AND SHARE THEM WITH THE GAMING COMMUNITY

SIGNIFICANT SCALE INDICATES THAT GAME CREATION IS NOT A NASCENT ACTIVITY

Build and share worlds with a community of players
132M MAU[1]
Over 200M copies sold

Construct 2D Super Mario courses, and share with friends and the community



Develop 3D multiplayer games with standards-based tools and features
(available free-to-play in Open Alpha)

Design, share, and monetize games in a free-to-play virtual universe
150M MAU[1]
(including 50%+ of U.S. consumers aged 15 and under)

Create and share experiences, maps, and games with friends and other players

Play thousands of games created by a community of players and create your own games with a variety of tools and tutorials

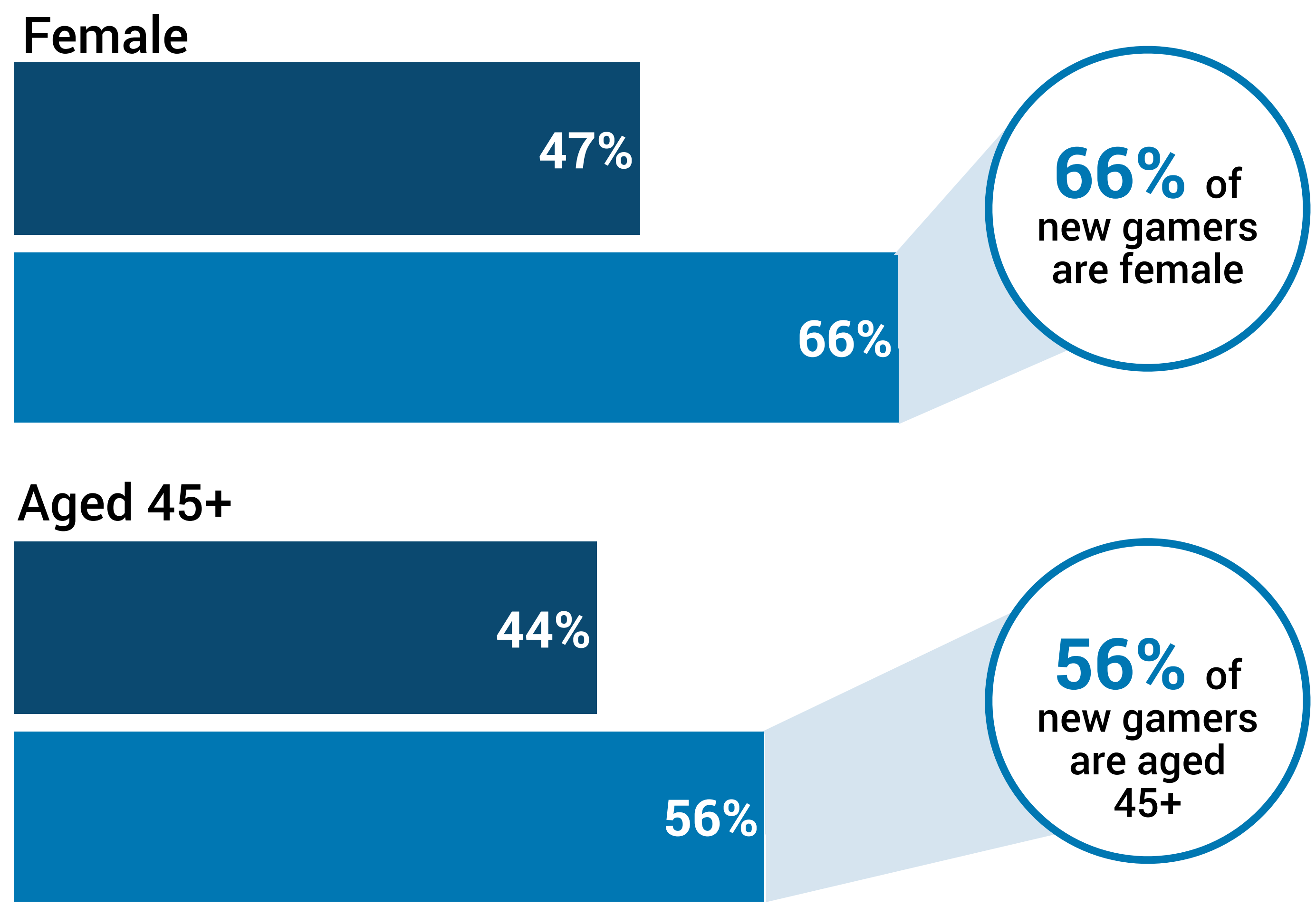
1. MAU and copies sold numbers reflect available information as of Sept. 29, 2020. All metrics reflect global values.
Sources: Activate analysis, Bloomberg, Company press releases, Company sites, TechCrunch, Twinfinite, The Verge, The Washington Post

There is a paradigm shift in the conventional idea of a gamer, as gaming has expanded into new audience segments beyond young men

DEMOGRAPHICS OF NEW VS. EXISTING GAMERS[1], U.S., 2020

ACTIVATE CONSUMER INSIGHT

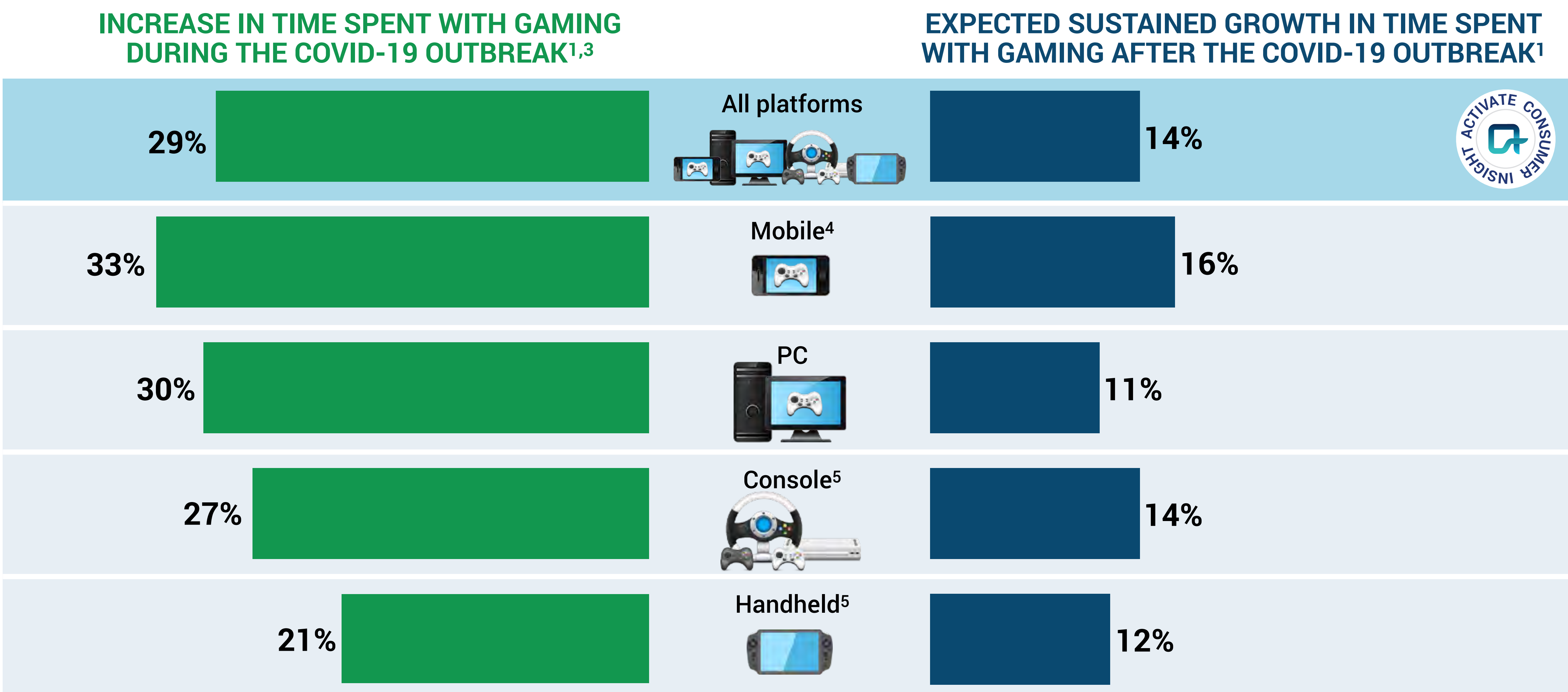
% Existing Gamers (consumers who played video games before the COVID-19 outbreak[2])
% New Gamers (consumers who started playing video games during the COVID-19 outbreak[3])



1. "Gamers" are defined as adults 18+ who currently play video games. 2. "Before the COVID-19 outbreak" refers to the 12-month period before the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. before Mar. 2020). 3. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Overall time spent gaming has dramatically increased during the COVID-19 outbreak – we expect to see sustained growth after the COVID-19 outbreak ends, especially on mobile platforms

TIME SPENT WITH GAMING DURING AND AFTER THE COVID-19 OUTBREAK[1] BY PLATFORM,
U.S., 2020 ONWARDS, % INCREASE VS. BEFORE THE COVID-19 OUTBREAK[2] AMONG ADULTS AGED 18-64



1. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). "After the COVID-19 outbreak" refers to the 12-month period after the end of the COVID-19 outbreak and subsequent social distancing measures. 2. "Before the COVID-19 outbreak" refers to the period before the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. before Mar. 2020). 3. This is an update to the "Rewire to Restart" report in May 2020, which indicated a 39% increase in time spent with gaming during the COVID-19 outbreak. 4. "Mobile" is defined as smartphones and tablets. 5. Nintendo Switch is included in "Console" and not included in "Handheld."
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Activate COVID-19 Consumer Tech & Media Research Study May 2020 (n = 1,925)

As consumers increase their engagement with gaming platforms, social elements become even more important to these users – offering these features will be essential to gamer satisfaction and retention

ACTIVATE CONSUMER INSIGHT

15%

of gamers[1] consider **social elements** as one of their **top reasons[2]** in selecting which games to play

MOBILE[3] GAMERS:

3.3x

As likely as non-mobile gamers to consider social elements as one of their top reasons in game selection

MULTI-PLATFORM GAMERS:

3.2x

As likely as single platform gamers to consider social elements as one of their top reasons in game selection

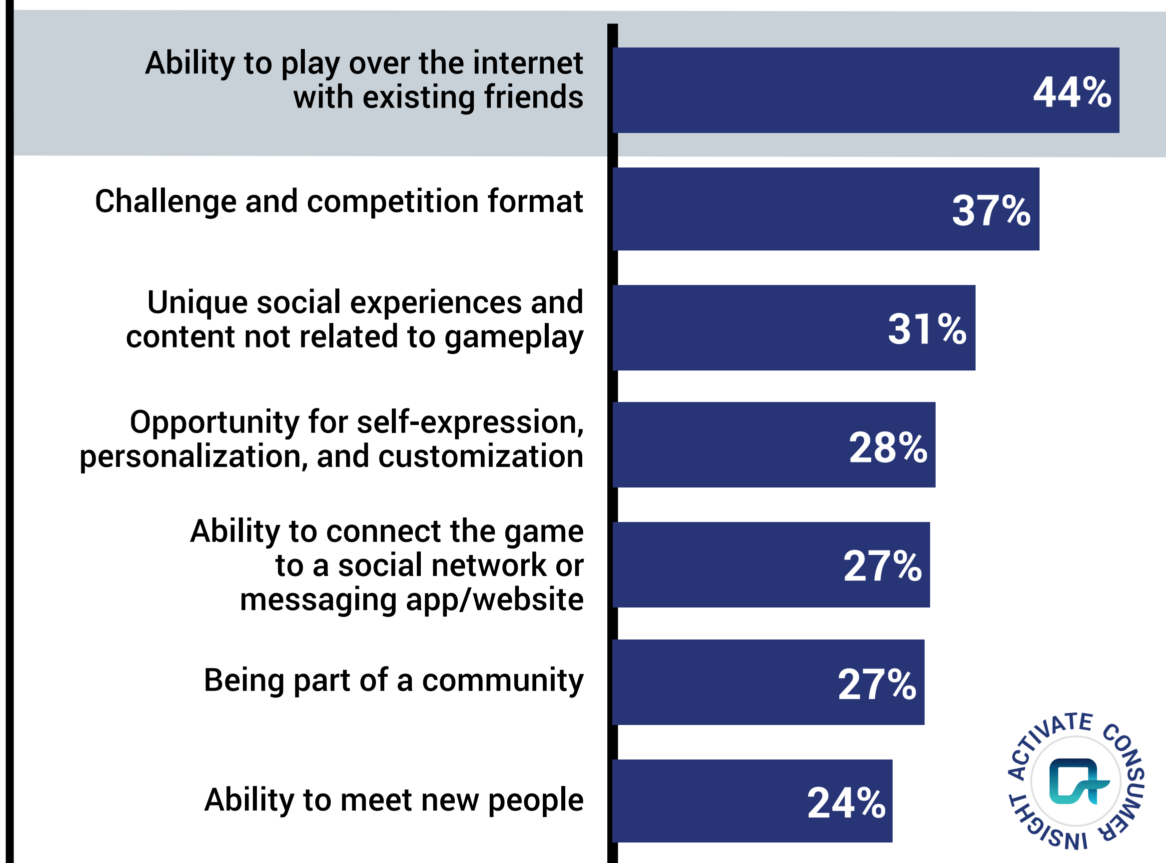
GAMING SERVICE USERS[4]:

2.5x

As likely as non-service users to consider social elements as one of their top reasons in game selection

MOST IMPORTANT SOCIAL FEATURES WHEN SELECTING WHICH GAME TO PLAY, U.S., 2020, % GAMERS[1] WHO CONSIDER SOCIAL ELEMENTS TO BE A TOP REASON[2] IN GAME SELECTION

FOR GAMERS[1] WHO CONSIDER SOCIAL ELEMENTS AS A TOP REASON[2] IN GAME SELECTION, THE MOST IMPORTANT SOCIAL FEATURE[5] IS THE ABILITY TO PLAY WITH FRIENDS



ACTIVATE CONSUMER INSIGHT

1. "Gamers" are defined as adults 18+ who currently play video games. 2. Gamers were asked to select up to 3 most important reasons in game selection. 3. "Mobile" is defined as smartphones and tablets. 4. "Gaming service users" are defined as gamers who currently use a gaming subscription and/or cloud gaming service. 5. Gamers who consider social elements as a top reason in game selection were asked to select up to 3 most important social elements in game selection.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Recognizing the importance of gaming as the next growth platform, the major technology companies are building their gaming stacks; Microsoft, Sony, and Tencent are nearly full stack players

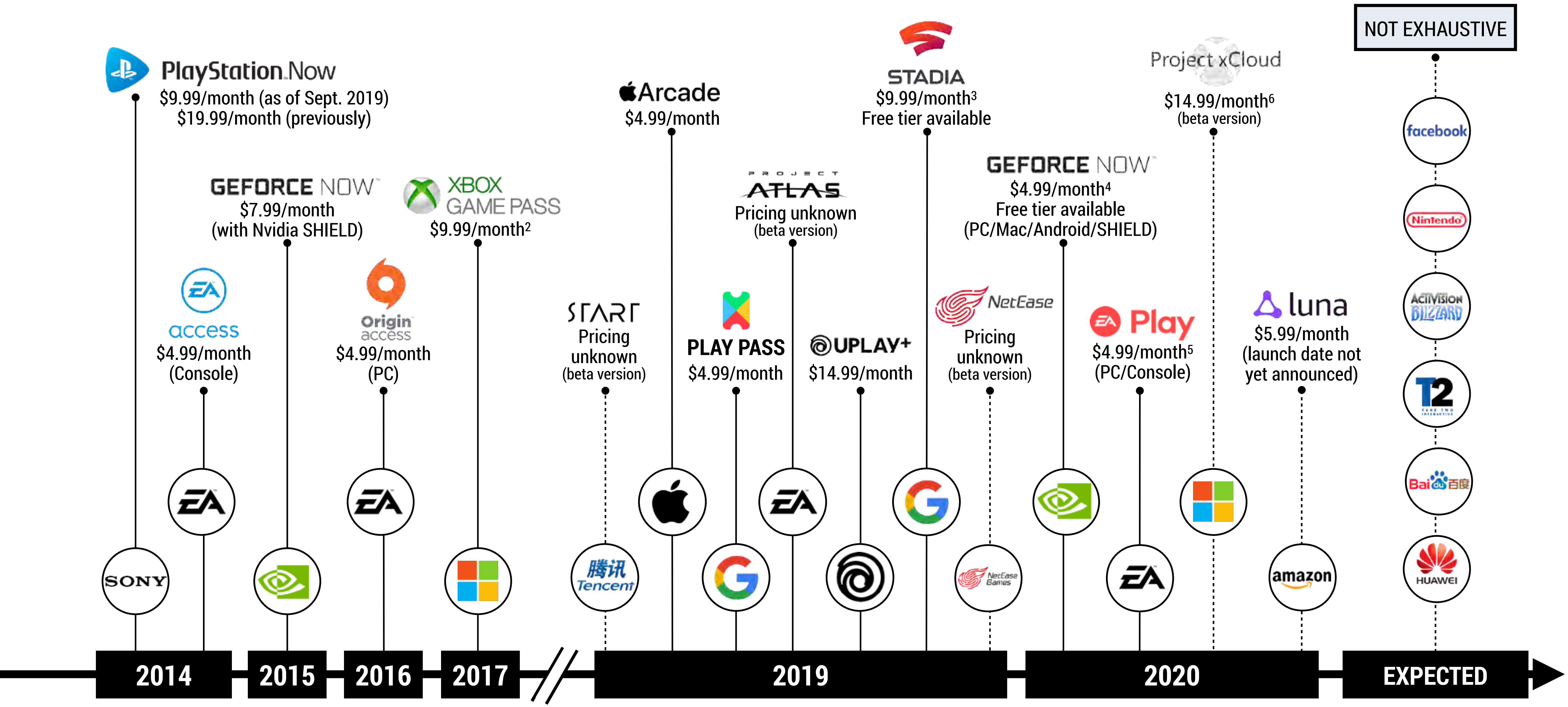
TECHNOLOGY PLATFORMS' PRESENCE IN GAMING[1]

	amazon		facebook	Google	Microsoft	SONY	Tencent
GAME PUBLISHER	games		ReadyAtDawn studios		XBOX GAME STUDIOS	Sony Interactive Entertainment	腾讯游戏 Tencent Games
VIRTUAL WORLD			facebook horizon[3]		MINECRAFT AltspaceVR		WeChat
CONSOLE					XBOX	PlayStation	
AR/VR DEVICE			oculus	GLASS	Microsoft HoloLens	PlayStation.VR	
CLOUD	luna[2]			STADIA	Project xCloud	PlayStation.Now	START[3]
APP STORE	amazon appstore	App Store		Google Play	Microsoft Store	PlayStation.Store	应用宝 myapp.com
SUBSCRIPTION SERVICE	luna[2] prime gaming	Arcade		STADIA Google Play Pass	XBOX GAME PASS Project xCloud[4] XBOX LIVE GOLD	PlayStation.Now PlayStation.Plus	START[3]
GAMING AS VIDEO	twitch		facebook gaming	YouTube			企鹅电竞 eGame 斗鱼 DOUYU.COM HUYA[5]

1. Information as of Oct. 2020. 2. Not publicly available. 3. Available in beta. 4. Only available through a bundle with Xbox Game Pass Ultimate. 5. Tencent is a majority stakeholder in both Huya and DouYu, which announced a merger on Oct. 12, 2020.
Sources: Activate analysis, Company sites

Major gaming and technology companies are continuing to develop their own subscription and cloud services to own the future of gaming – this will accelerate the availability of multiplayer and cross-platform gaming

TIMELINE OF GAMING SUBSCRIPTION AND CLOUD GAMING SERVICE RELEASES[1], GLOBAL, 2014 ONWARDS



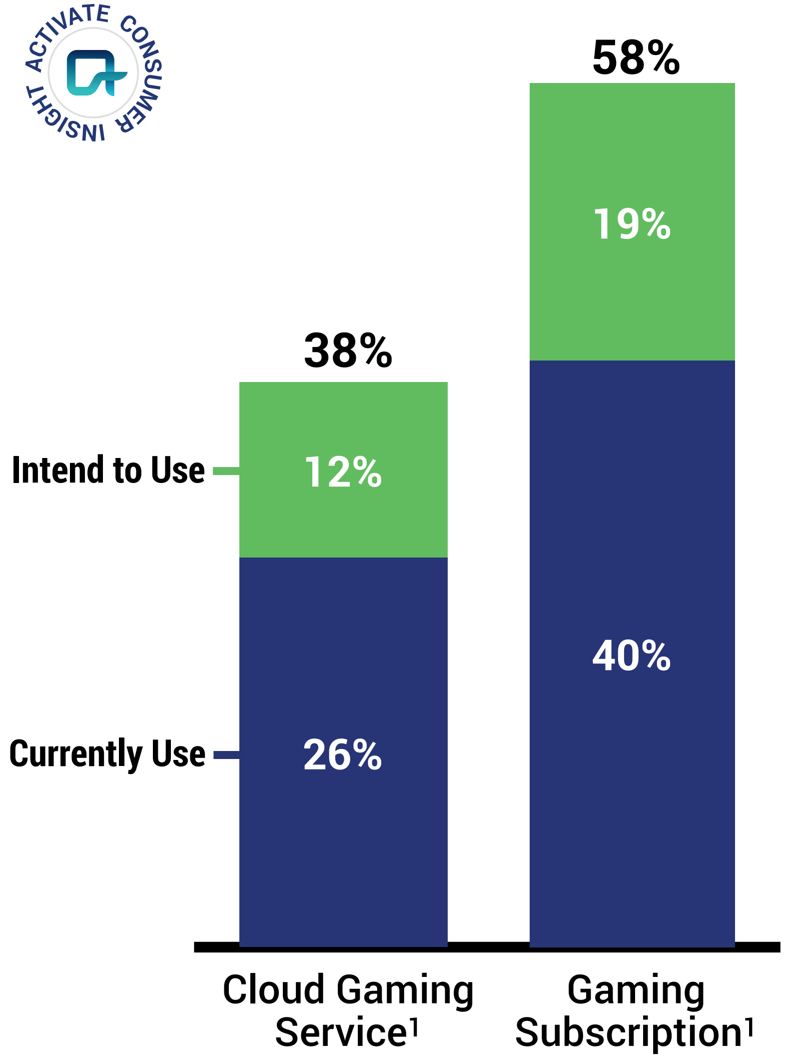
1. Positioning represents either product announcement or launch date. Reflects services' monthly base prices as of Sept. 29, 2020. 2. Reflects price for both PC and console subscriptions. 3. Reflects price for "Pro subscription." 4. Reflects price for "Founders membership." 5. EA Access and Origin Access replaced with EA Play as of Aug. 2020. 6. Only available bundled with Game Pass Ultimate. Reflects price for "Game Pass Ultimate."
Sources: Activate analysis, Company press releases, Company sites, GameSpot, VentureBeat, The Verge

activate consulting

WSJ TECH LIVE

Cloud gaming and gaming subscription services are seeing significant penetration and interest – we expect that the winning services will feature the top titles

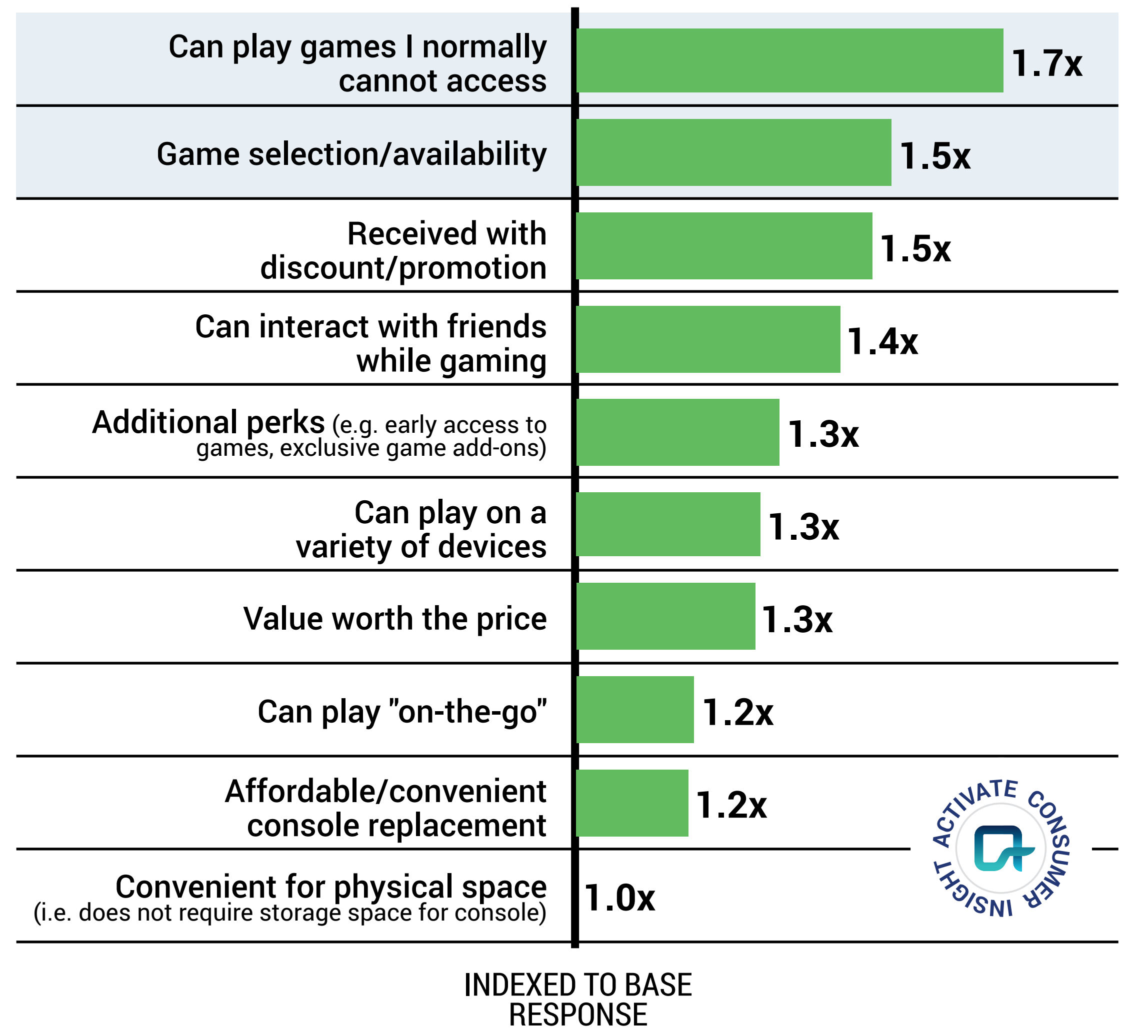
CURRENT AND INTENDED USAGE OF GAMING SUBSCRIPTIONS AND CLOUD GAMING SERVICES[1,2], U.S., 2020, % GAMERS[3]



EXAMPLE SERVICES

- Arcade
- Google Play Pass
- NVIDIA GEFORCE NOW
- ONLINE Nintendo Switch Online
- PlayStation.Now
- PlayStation.Plus
- STADIA
- XBOX GAME PASS
- XBOX LIVE GOLD

PRIMARY REASONS FOR USING GAMING SUBSCRIPTIONS AND CLOUD GAMING SERVICES[1], U.S., 2020, % GAMERS[3] USING A GAMING SUBSCRIPTION OR CLOUD GAMING SERVICE[1] INDEXED TO BASE RESPONSE

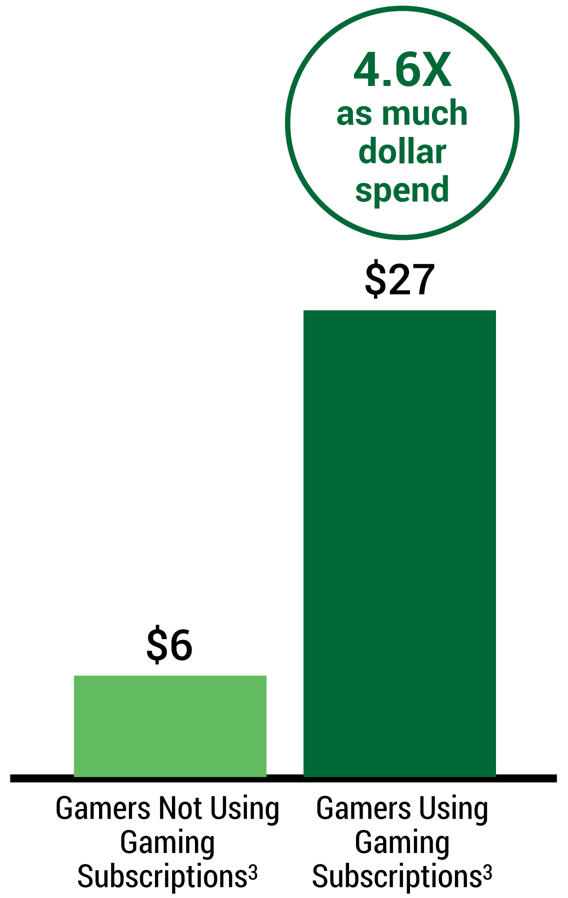


1. Gaming subscriptions and cloud gaming services are not mutually exclusive. "Gaming subscription" is defined as a gaming service with a subscription pricing plan (e.g. pay $4.99/month for access to a game library). "Cloud gaming service" is defined as a gaming service that provides the ability to play video games by streaming from another device (e.g. server through the cloud). 2. Figures do not sum due to rounding. 3. "Gamers" are defined as adults 18+ who currently play video games.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

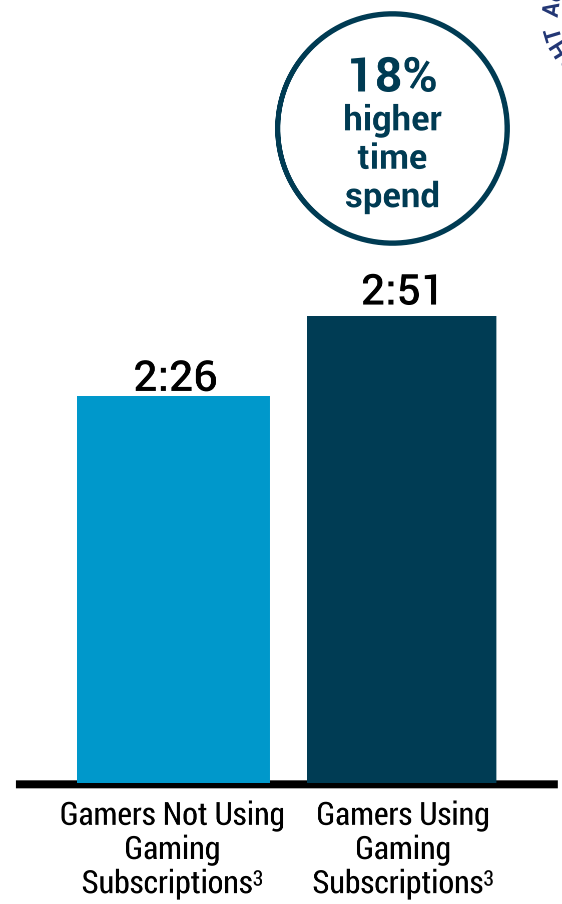
COVID-19 has accelerated gaming subscriptions as more gamers have signed up since the beginning of shelter-in-place; gaming companies will focus on retaining these high-value players

AVERAGE AMOUNT AND TIME SPENT BY GAMERS[1,2], U.S., 2020, USD PER MONTH / HOURS:MINUTES PER DAY

GAMERS USING GAMING SUBSCRIPTIONS[3] ARE HIGHER-VALUE PLAYERS OVERALL



DOLLARS SPENT PER MONTH[1]

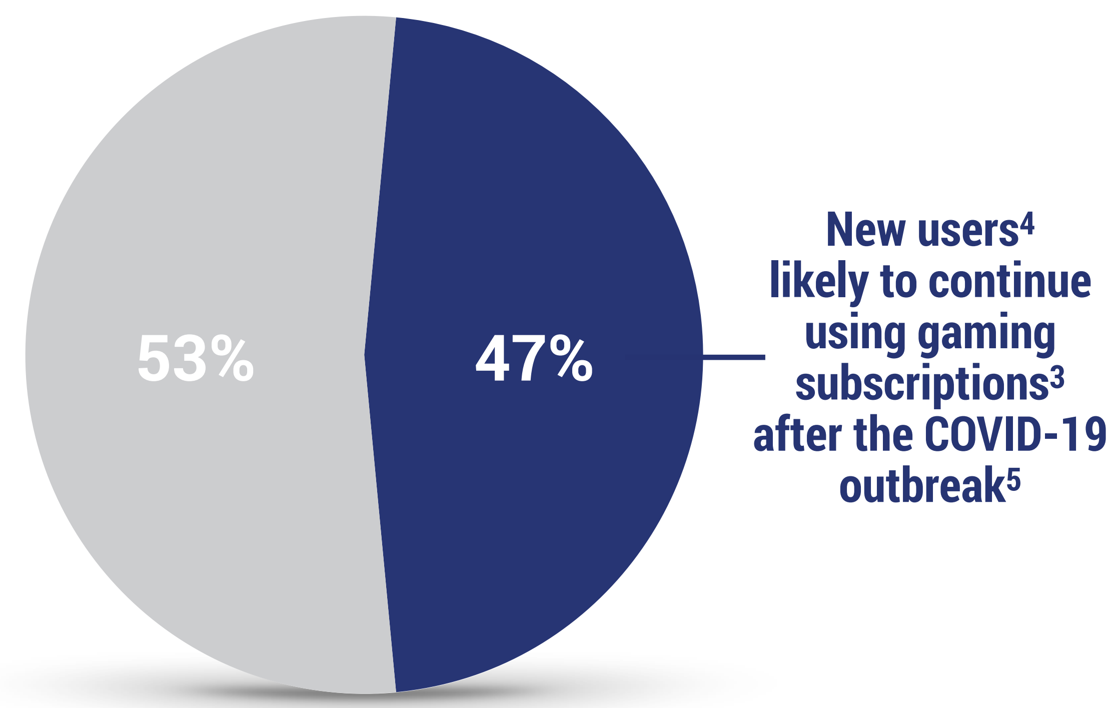


HOURS SPENT PER DAY

EXPECTED SUSTAINED GROWTH IN NEW USERS[4], U.S., 2020 ONWARDS, % NEW GAMING SUBSCRIPTION USERS

13M new users[4]

started using gaming subscriptions[3] during the COVID-19 outbreak[5]



1. Includes money spent on video games and other video gaming purchases (e.g. in-app purchases) across all devices. 2. "Gamers" are defined as adults 18+ who currently play video games. 3. "Gaming subscriptions" are defined as gaming services with a subscription pricing plan. 4. "New users" are defined as gamers who have begun using a gaming subscription since the COVID-19 outbreak (as of May 2020) and did not use one in the 12 months prior to outbreak. 5. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). "After the COVID-19 outbreak" refers to the 12-month period after the end of the COVID-19 outbreak and subsequent social distancing measures.

Sources: Activate analysis, Activate 2019 Consumer Tech & Media Research Study (n = 4,006), Activate COVID-19 Consumer Tech & Media Research Study April 2020 (n = 1,866), eMarketer, Nielsen, PricewaterhouseCoopers

Access to highly valued content, cloud and streaming technology, and favorable pricing models will enable successful cloud gaming services

ENABLERS	IMPACT	HOW THESE WILL ENABLE SUCCESS
CONTENT AVAILABILITY	Highly valuable libraries of video game titles with consistent availability	• **Content availability** and **content exclusivity** are top reasons why consumers start using gaming subscription and/or cloud gaming services
CONNECTIVITY	Multiplayer gameplay available across all devices at high quality	• **High bandwidth** and **low latency** connections are essential for providing high-quality streaming gameplay
CLOUD-COMPUTING TECHNOLOGY	Infrastructure and hardware to support gameplay on any device	• **Robust cloud infrastructure** and **streaming technology** will enable any device to have high-quality gaming experiences (e.g. mobile phones, low-end PCs)
SUBSCRIPTION & FREE-TO-PLAY PRICING	Lower financial barriers to adoption	• **Subscription-based** and **free-to-play** services can help to drive adoption and encourage gamers to explore more titles

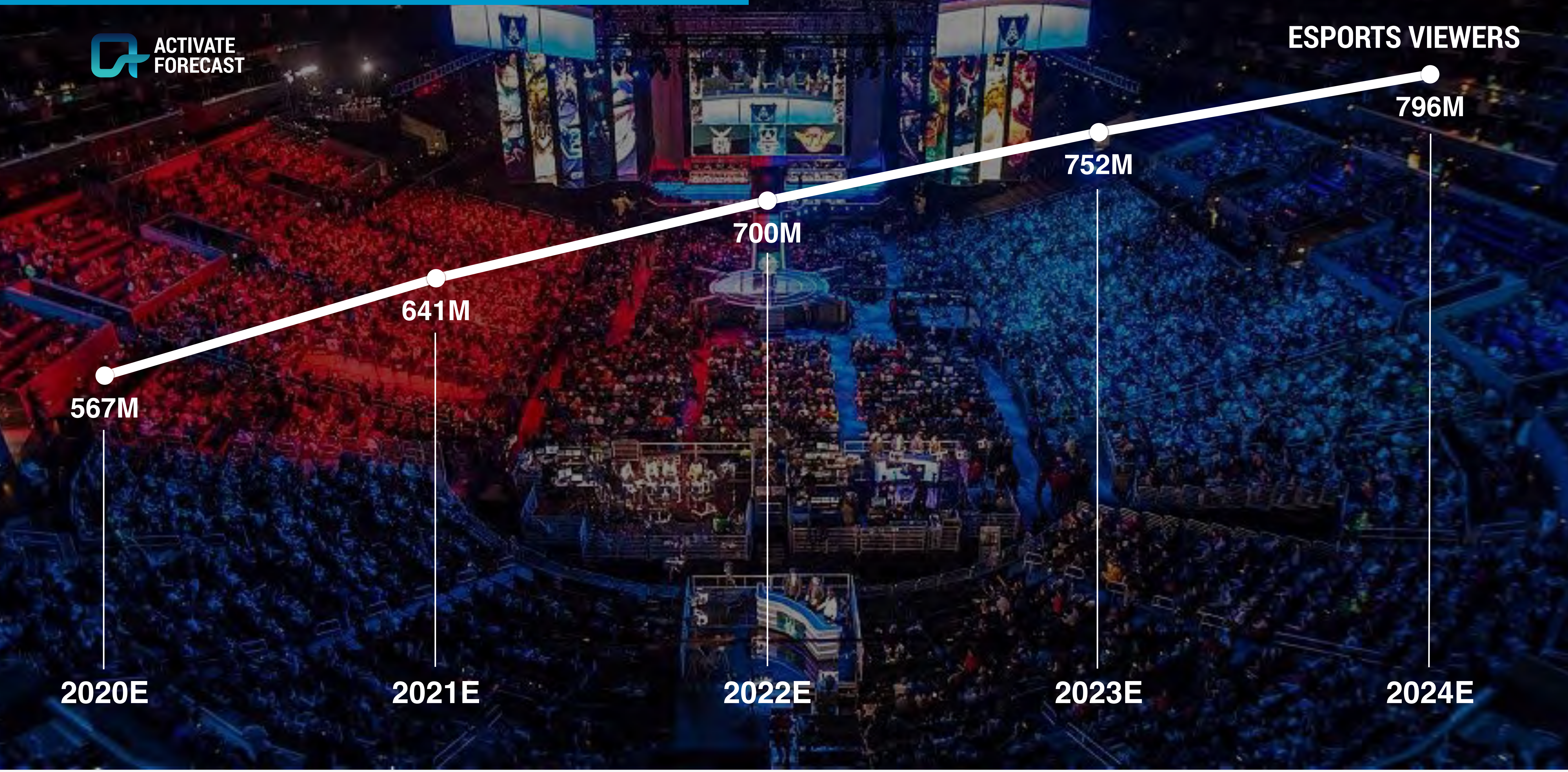
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

CONTENTS

activate consulting
www.activate.com

We forecast that esports will reach roughly 800 million viewers worldwide by 2024

ESPORTS VIEWERSHIP, GLOBAL, 2020E-2024E, MILLIONS



Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Newzoo, SportyTell

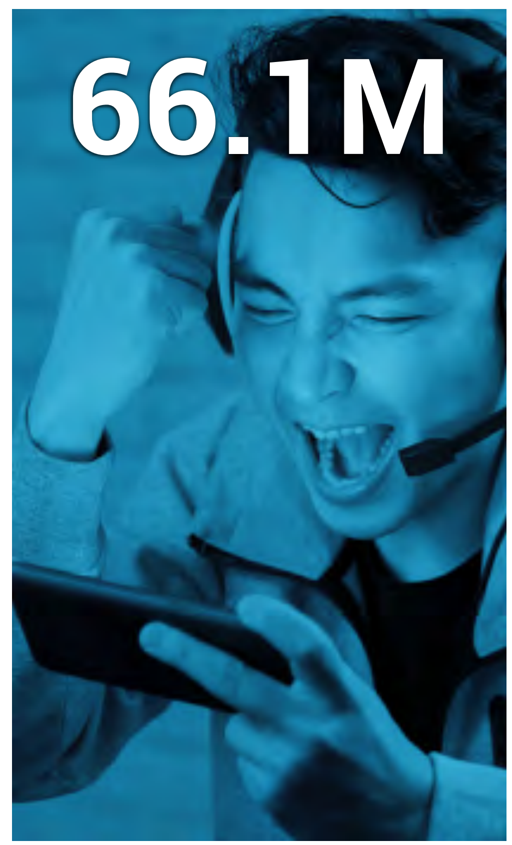
Esports viewership grew rapidly between 2019 and 2020, including the time since the beginning of the COVID-19 outbreak

ESPORTS VIEWERSHIP,
U.S., 2019 VS. 2020E, MILLIONS ESPORTS VIEWERS[1] AGED 18+

ACTIVATE FORECAST

69%
GROWTH IN ESPORTS VIEWERSHIP

2019



2020E

ESPORTS VIEWERSHIP HAS LARGE GROWTH POTENTIAL:

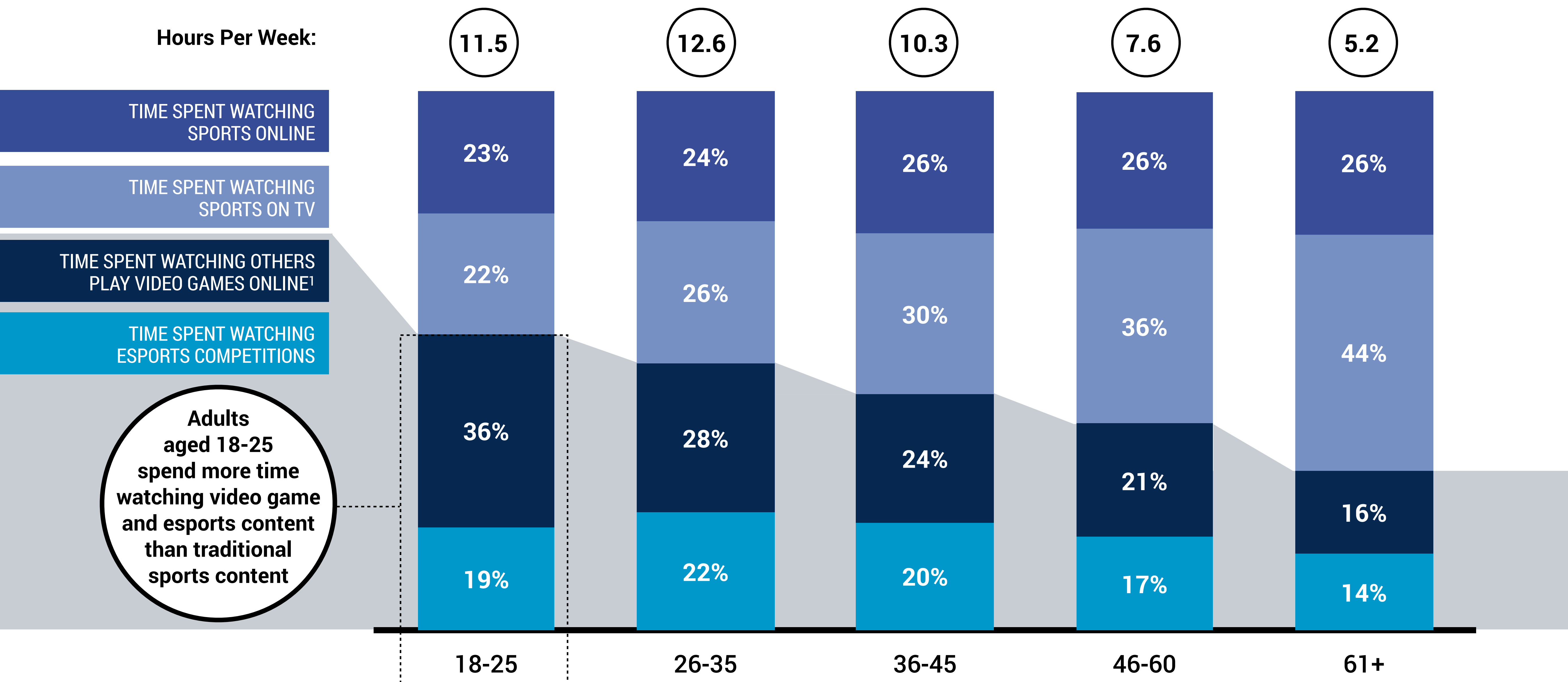
39.2M

current non-Esports Viewers are interested in watching esports

1. "Esports Viewers" refer to consumers who have watched at least one esports competition.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), U.S. Census Bureau

Younger viewers continue to push esports into the mainstream, spending more time watching esports and video game content than traditional sports content

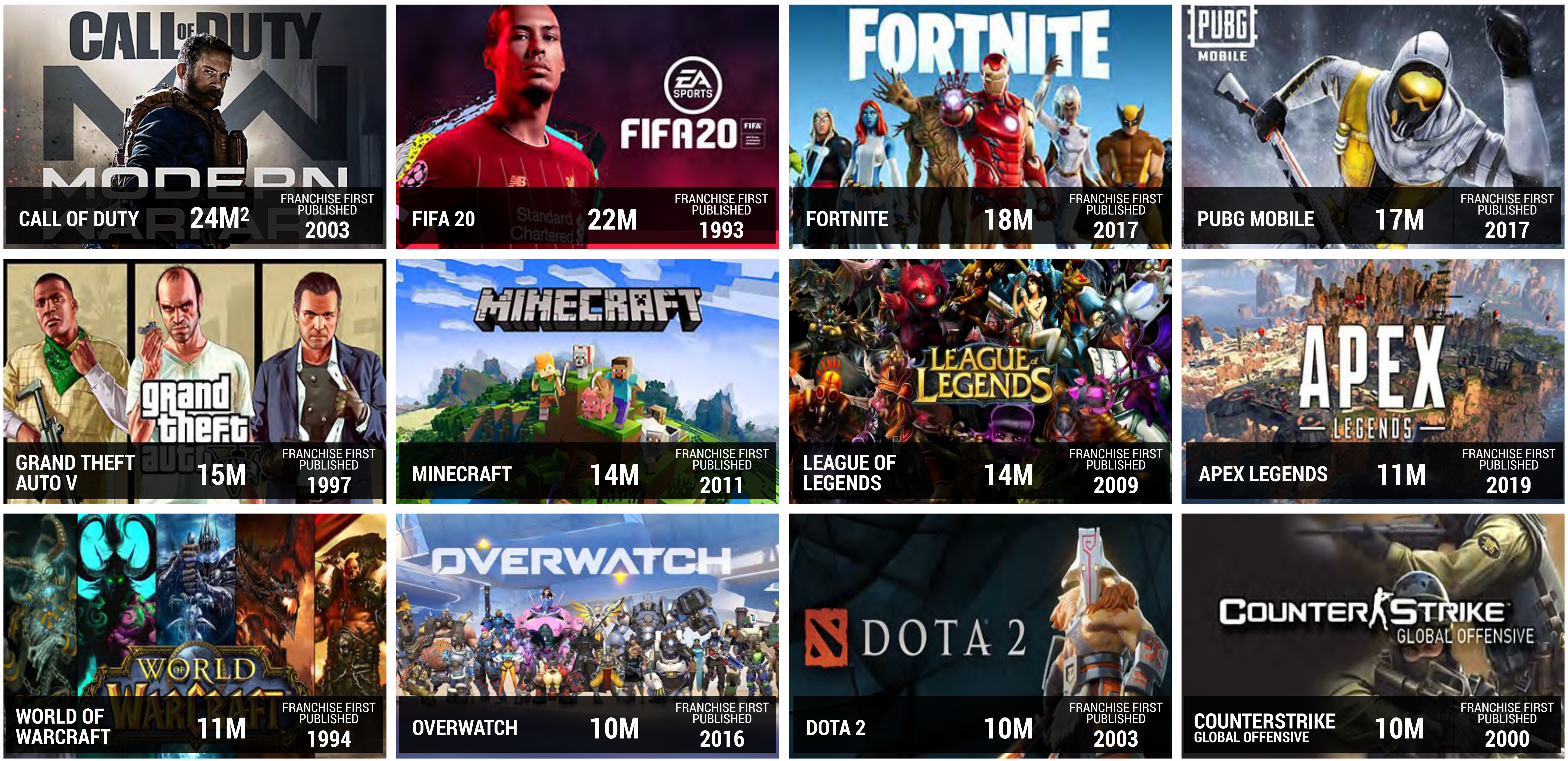
AVERAGE WEEKLY TIME SPENT WATCHING TRADITIONAL SPORTS AND VIDEO GAME / ESPORTS CONTENT BY AGE GROUP,
GLOBAL, 2020, % HOURS



1. "Time spent watching others play video games online" differs from watching esports competitions in that the games watched are not competitive and players do not play to win money.
Sources: Activate analysis, Limelight Networks

Well-established video game franchises are driving esports viewership

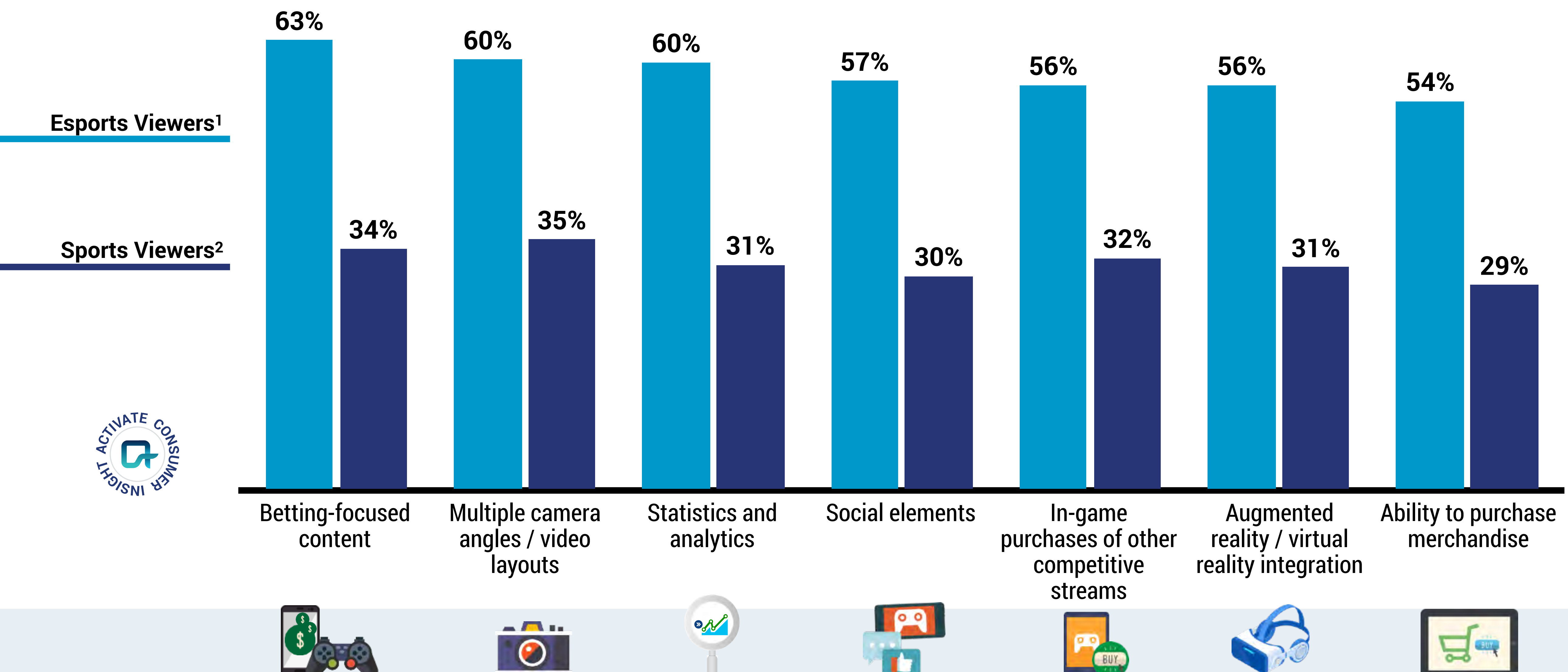
TOP TITLES WATCHED BY NUMBER OF ESPORTS VIEWERS[1], U.S., 2020, MILLIONS ESPORTS VIEWERS AGED 18+



1. "Esports Viewers" refer to consumers who have watched at least one esports competition. Number of Esports Viewers for each title refers to total viewers of the listed title. 2. Call of Duty viewership number refers to total viewers of all titles within the franchise.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), U.S. Census Bureau, VGChartz

Esports Viewers consider enhanced live viewing features essential to the experience, suggesting that traditional sports will adopt features already available in esports streams and broadcasts

INTEREST IN LIVE VIEWING FEATURES, U.S., 2020, % ESPORTS VIEWERS[1] / % SPORTS VIEWERS[2] AGED 18+



1. "Esports Viewers" refer to consumers who have watched at least one esports competition. 2. "Sports Viewers" refer to consumers who have followed (e.g. attended live events in person, watched games or highlights, read articles or statistics) at least one professional/collegiate traditional sport in the last 12 months.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

activate consulting

WSJ TECH LIVE

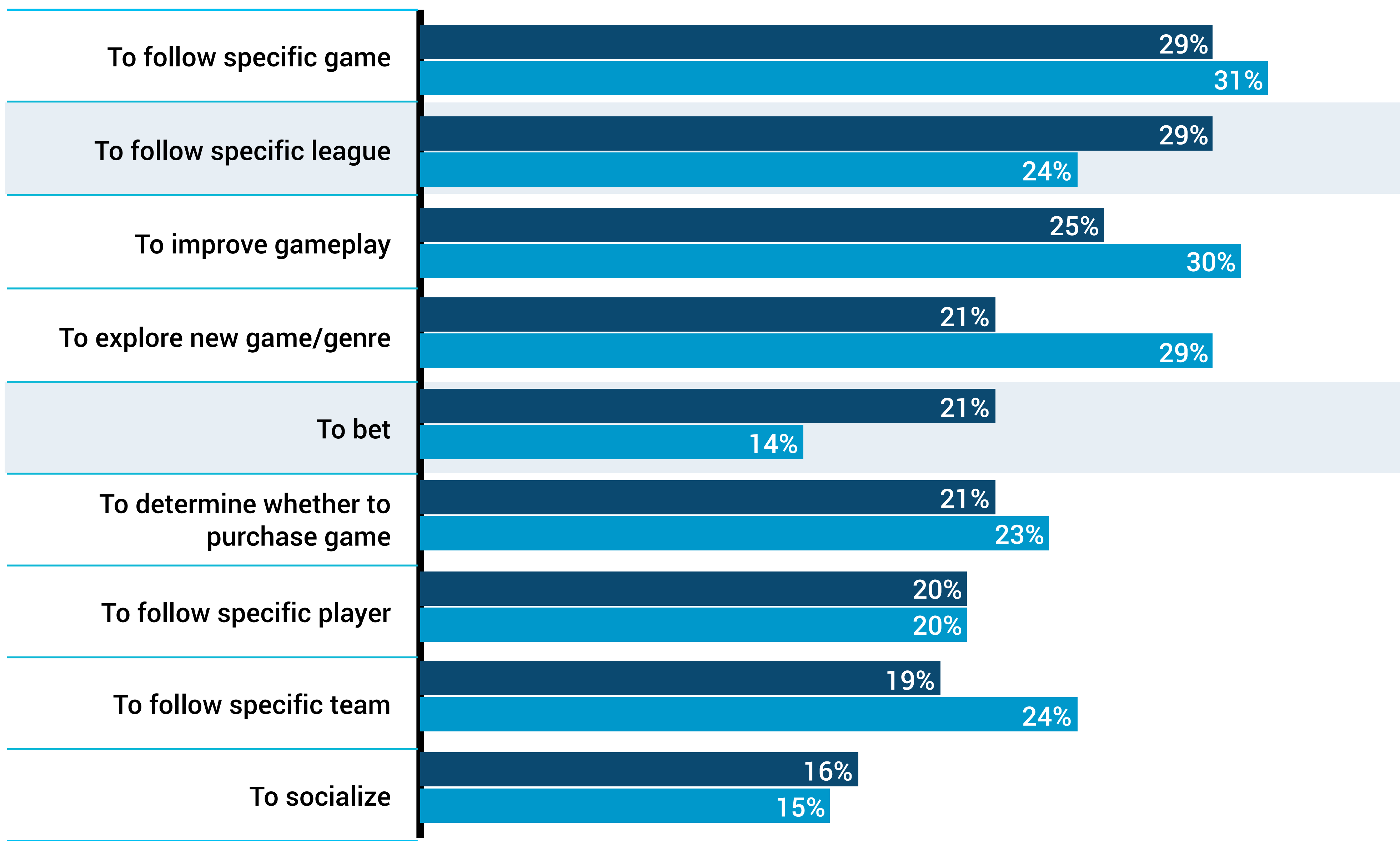
New Esports Viewers watch for different reasons than Existing Esports Viewers – New Esports Viewers are more motivated by betting and an affinity for specific esports leagues

REASONS FOR WATCHING ESPORTS, U.S., 2020, % ESPORTS VIEWERS[1] AGED 18+

ACTIVATE CONSUMER INSIGHT

NEW ESPORTS VIEWERS
started watching esports between Sept. 2019-Aug. 2020

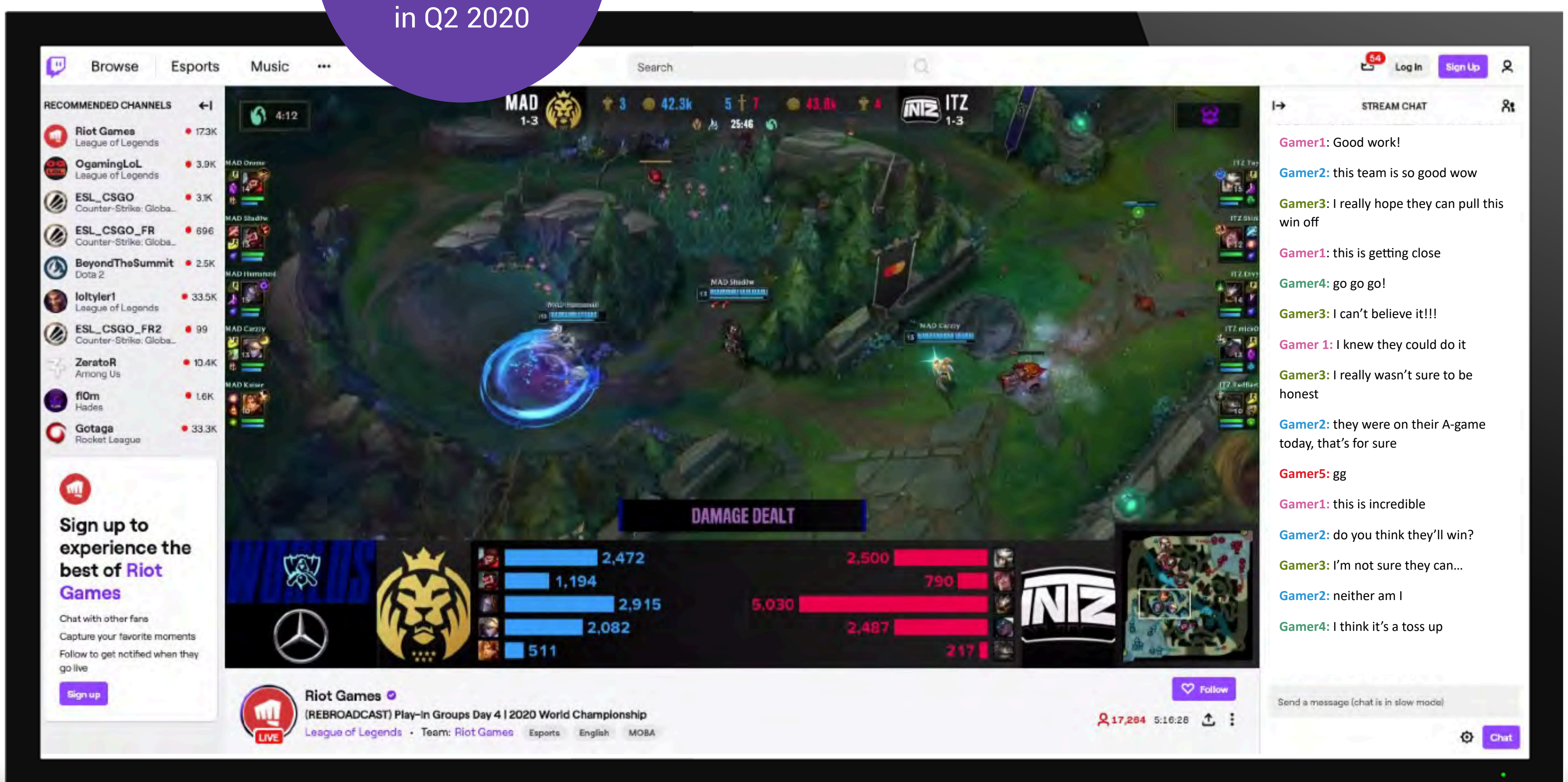
EXISTING ESPORTS VIEWERS
started watching esports before Sept. 2019



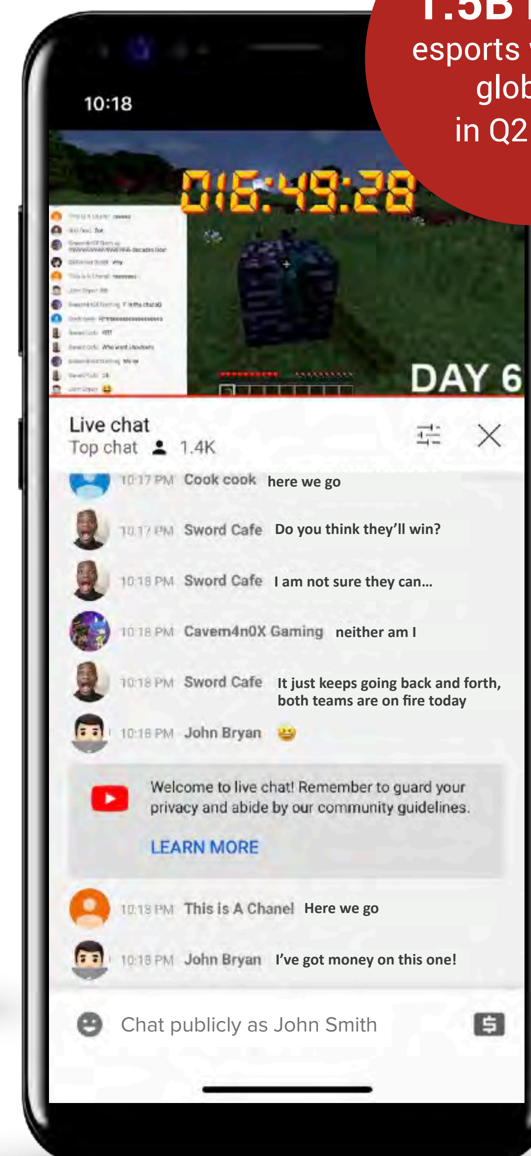
1. "Esports Viewers" refer to consumers who have watched at least one esports competition.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Twitch and YouTube (the two largest esports viewing platforms in the U.S.) offer integrated social functions, but lack comprehensive statistics and analysis, betting integration, and data on past competitions

5B hours
esports watched globally in Q2 2020



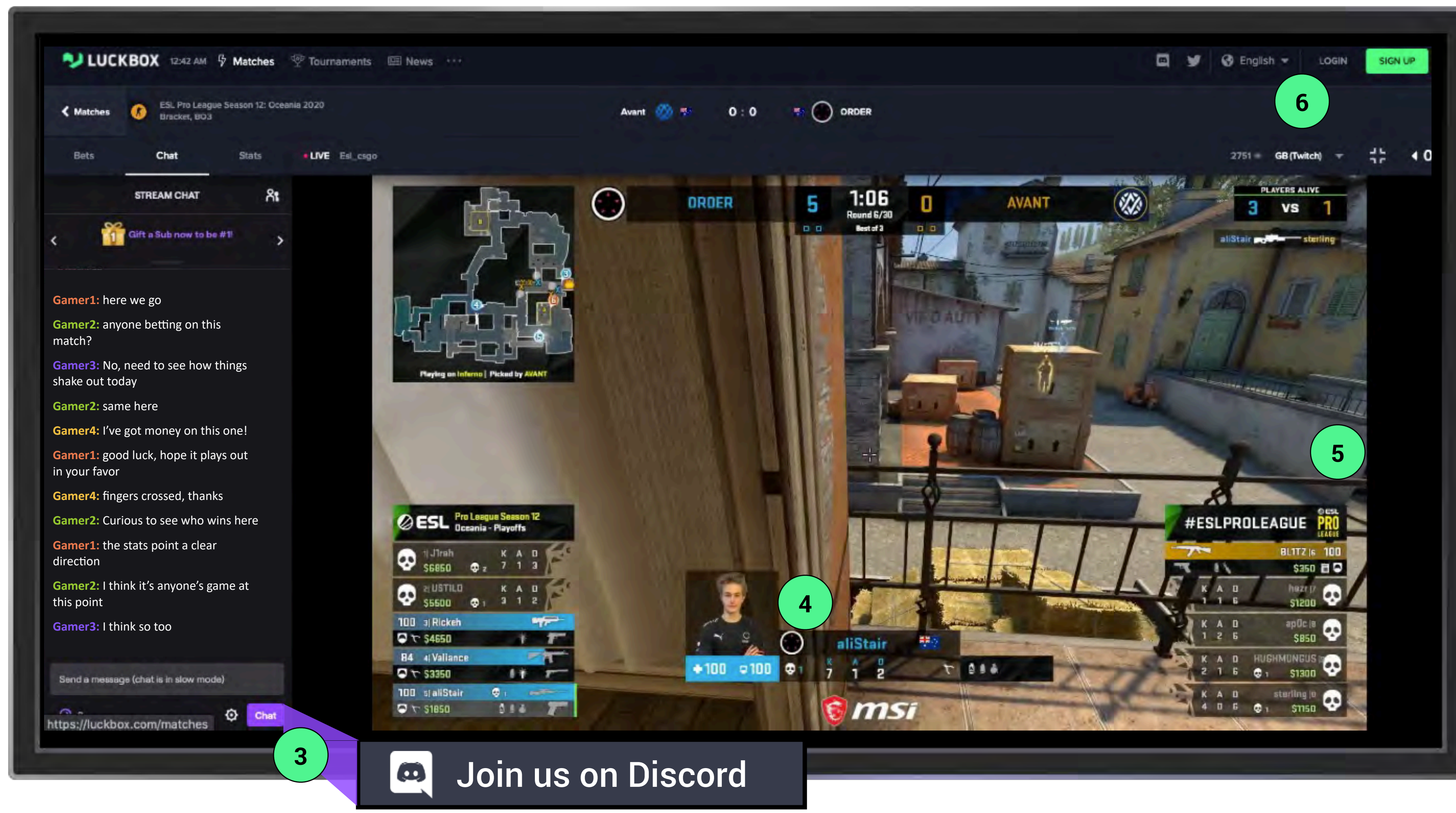
1.5B hours
esports watched globally in Q2 2020



Sources: Activate analysis, Company sites, Stream Hatchet, Streamlabs

Luckbox, a digital esports betting platform, provides an example of what Esports Viewers expect in a live viewing experience

LUCKBOX : COUNTER STRIKE GLOBAL OFFENSIVE



1. **Statistics and analysis:** win-rate from the last 12 months
2. **Betting-focused content:** view of in-game spread and ability to wager
3. **Social elements:** in-game chat and ability to follow/ communicate with other viewers
4. **Multiple camera angles / video layouts:** indication of which player's screen is currently displayed and their current standings
5. **Statistics and analysis:** in-game point counts
6. **Ability to switch commentator language via Twitch integration**

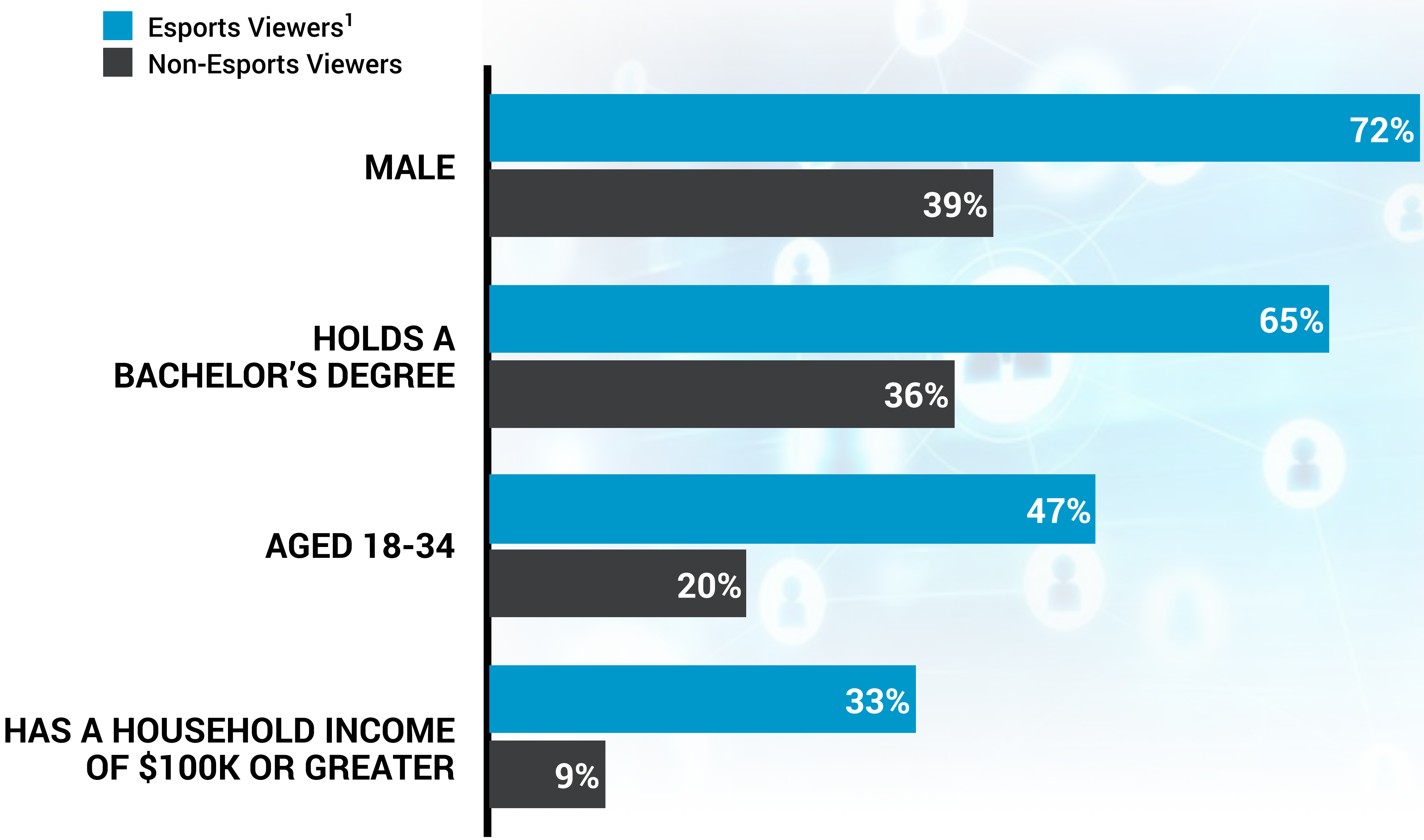
activate consulting

Sources: Activate analysis, Luckbox

WSJ TECH LIVE

Esports Viewers are more likely to be male, young, affluent, and educated than non-Esports Viewers

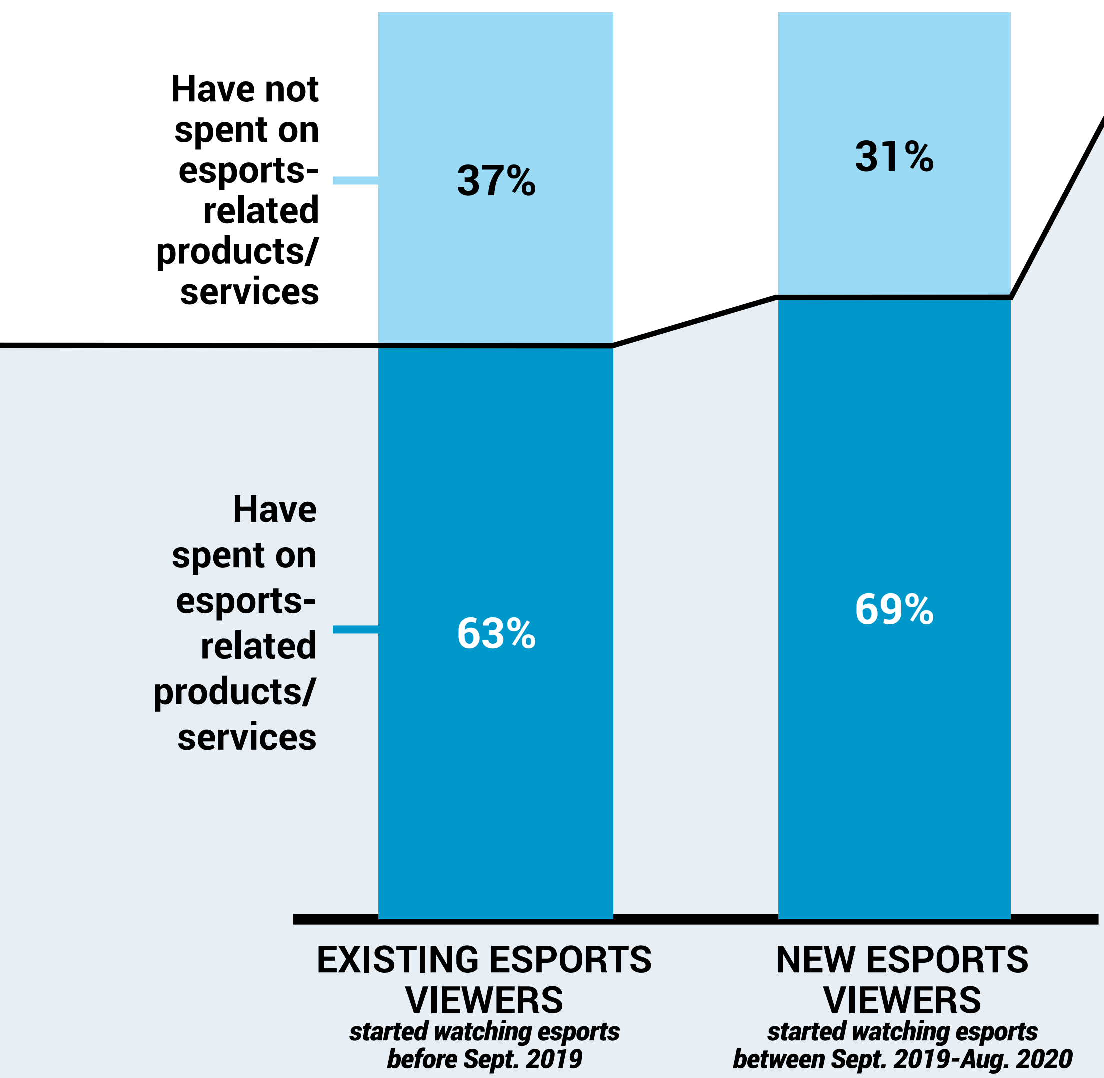
DEMOGRAPHICS, U.S., 2020, % ADULTS AGED 18+



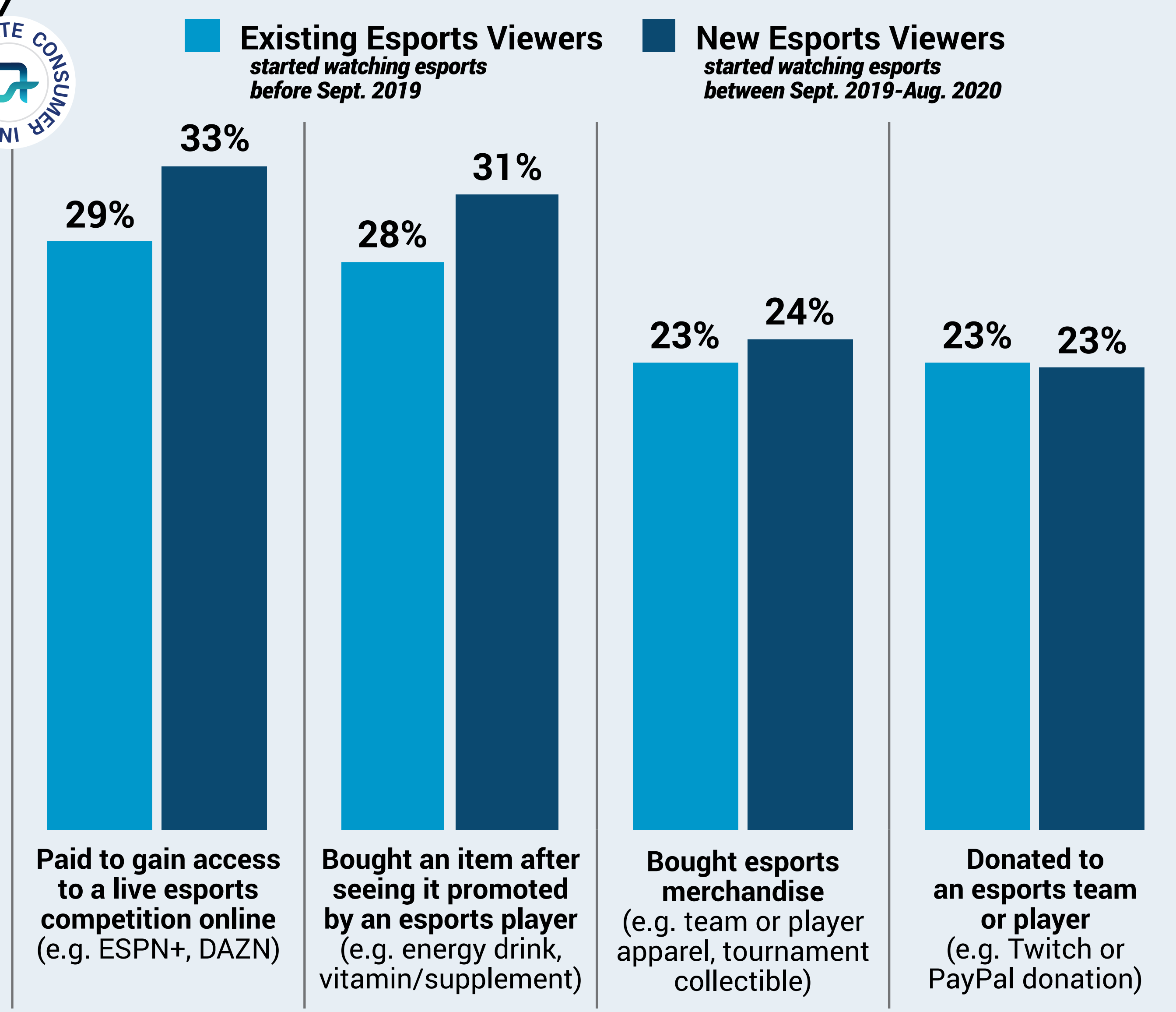
1. "Esports Viewers" refer to consumers who have watched at least one esports competition.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

New Esports Viewers are more likely to have made esports purchases than Existing Esports Viewers; live online competitions are the most popular purchase category for both new and existing viewers

ESPORTS SPENDING BEHAVIOR,
U.S., 2020, % ESPORTS VIEWERS[1] AGED 18+



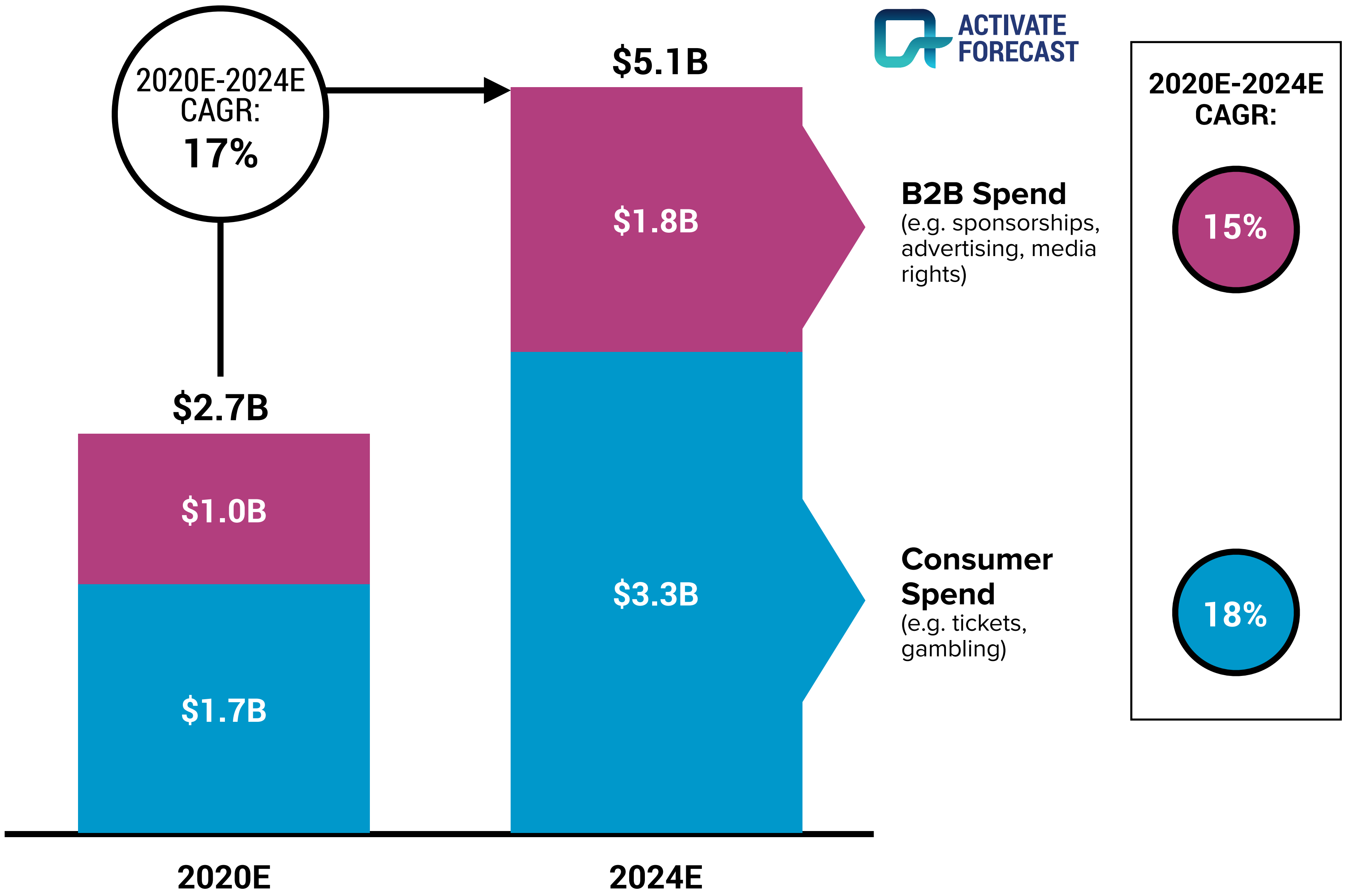
ESPORTS SPENDING BEHAVIOR BY TYPE OF SPEND,
U.S., 2020, % ESPORTS VIEWERS[1] AGED 18+



1. "Esports Viewers" refer to consumers who have watched at least one esports competition.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Esports will see significant revenue growth over the next 4 years, driven primarily by the continued rise in consumer spend

ESPORTS REVENUE BY TYPE, GLOBAL, 2020E VS. 2024E, BILLIONS USD



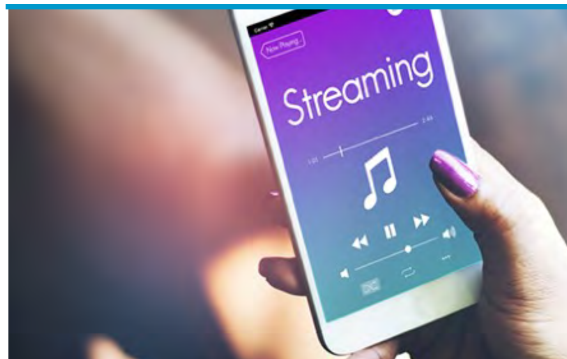
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, The Morning Call, Newzoo, PricewaterhouseCoopers

Esports Viewers also spend considerably more money than non-Esports Viewers on other media products and services such as music, video games, and video

ESPORTS VIEWER[1] AVERAGE DOLLAR SPEND INDEXED AGAINST NON-ESPORTS VIEWER AVERAGE DOLLAR SPEND BY MEDIA TYPE,
U.S., 2020, INDEXED SCORE OF ESPORTS VIEWERS VS. NON-ESPORTS VIEWERS AGED 18+

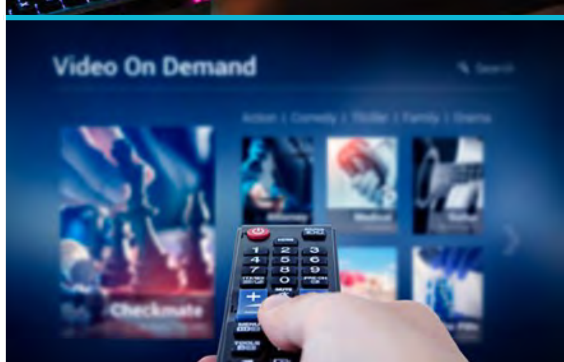
LEVEL OF DOLLAR SPEND COMPARISON

Esports Viewers[1] vs. Non-Esports Viewers

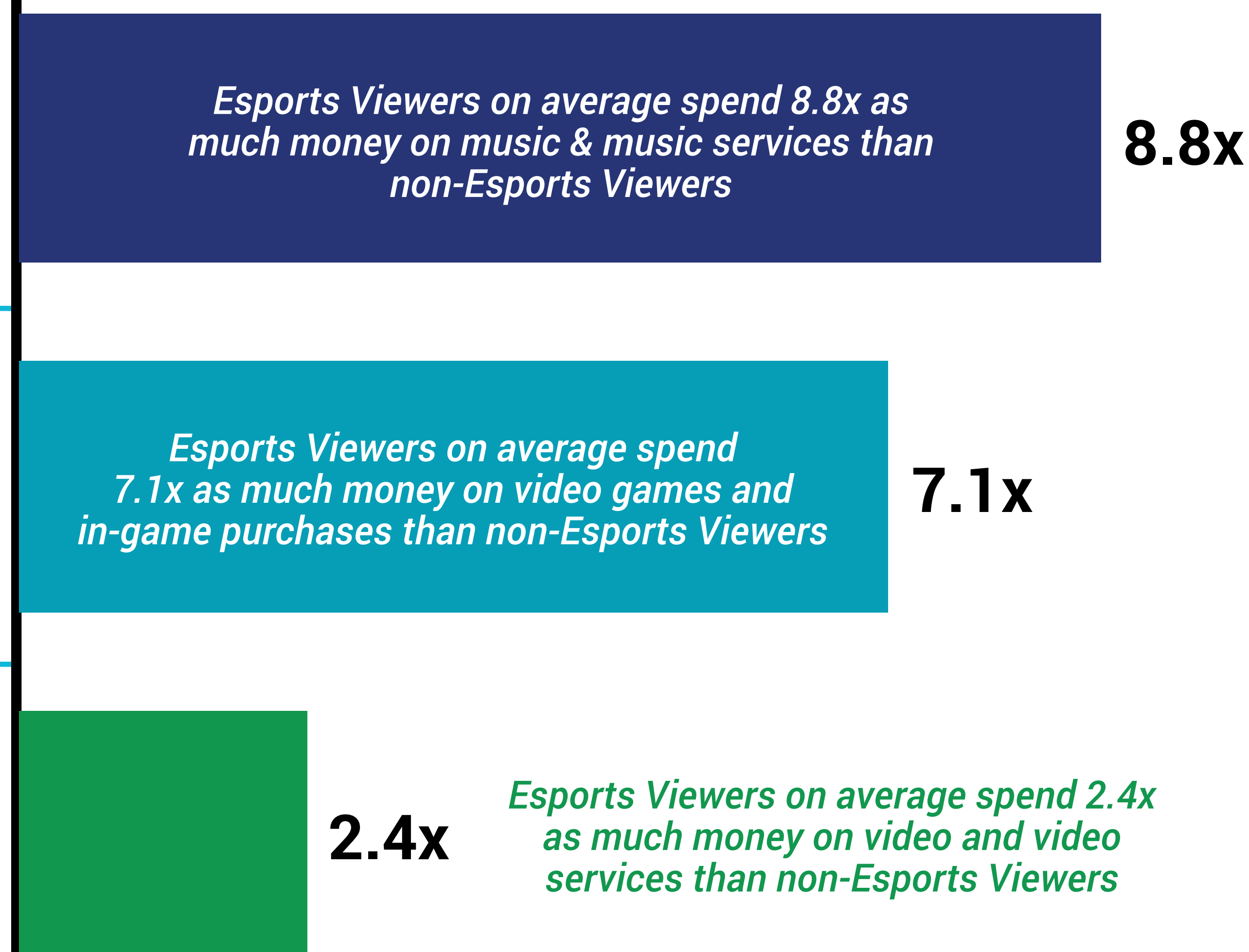


Music and Music Services
(e.g. streaming, satellite radio)

Video Games and In-Game Purchases
(e.g. new titles, in-app upgrades)



Video and Video Services
(e.g. streaming, cable/satellite TV)

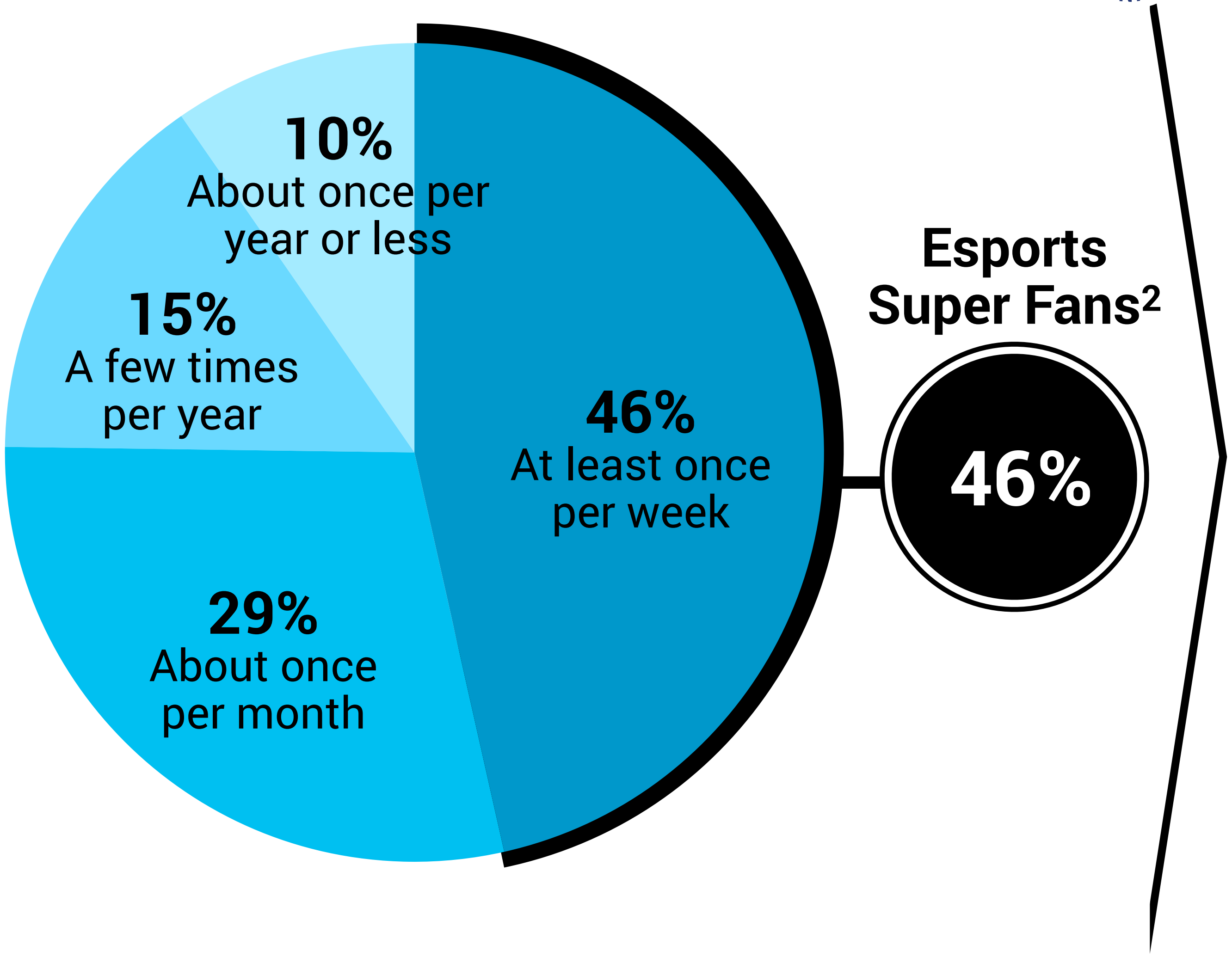


1. "Esports Viewers" refer to consumers who have watched at least one esports competition.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Beyond the direct revenues that esports generates, esports will be critical to the video game industry overall, as it will continue to drive gamer spend

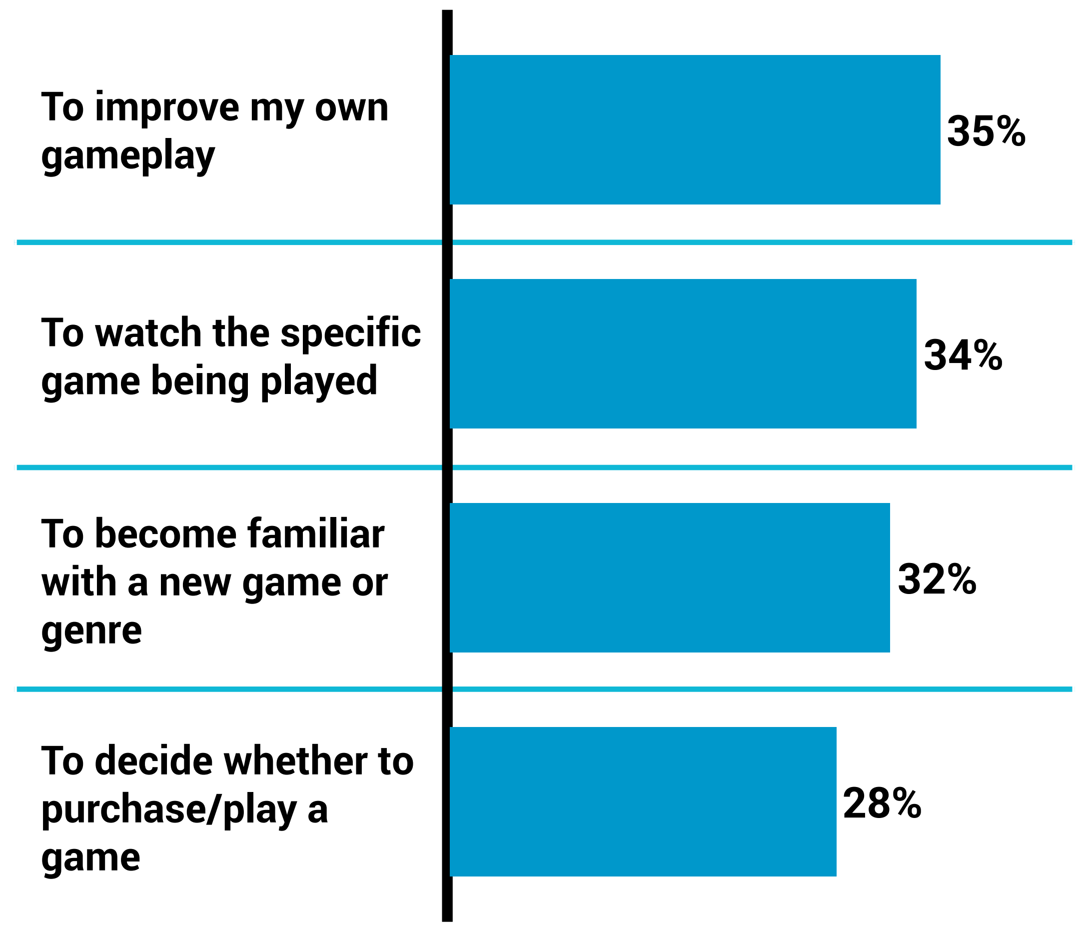
ESPORTS VIEWERS BY FREQUENCY OF VIEWING, U.S., 2020, % ESPORTS VIEWERS[1]

TOTAL ESPORTS VIEWERS[1]: 66M



ESPORTS SUPER FANS BY REASON FOR WATCHING ESPORTS, U.S., 2020, % ESPORTS SUPER FANS[2]

ESPORTS DRIVES ENGAGEMENT AND CONSUMER SPEND FOR VIDEO GAMES



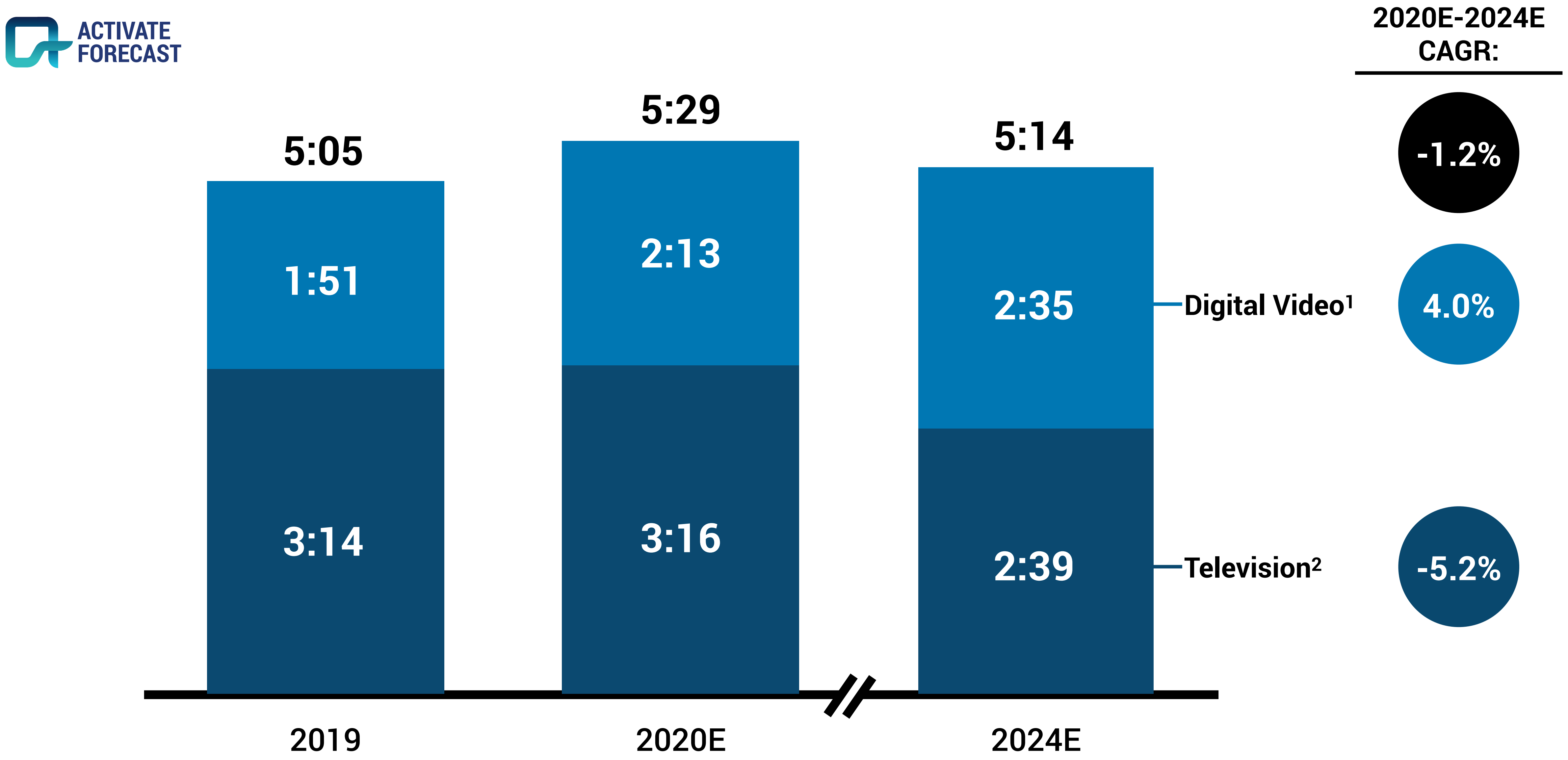
1. "Esports Viewers" refer to consumers who have watched at least one esports competition.
2. "Esports Super Fans" are adults 18+ who watch esports competitions at least once per week.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

CONTENTS

activate consulting
www.activate.com

Driven by COVID-19, daily video consumption increased by nearly 25 minutes in 2020, with most of the growth coming from digital video

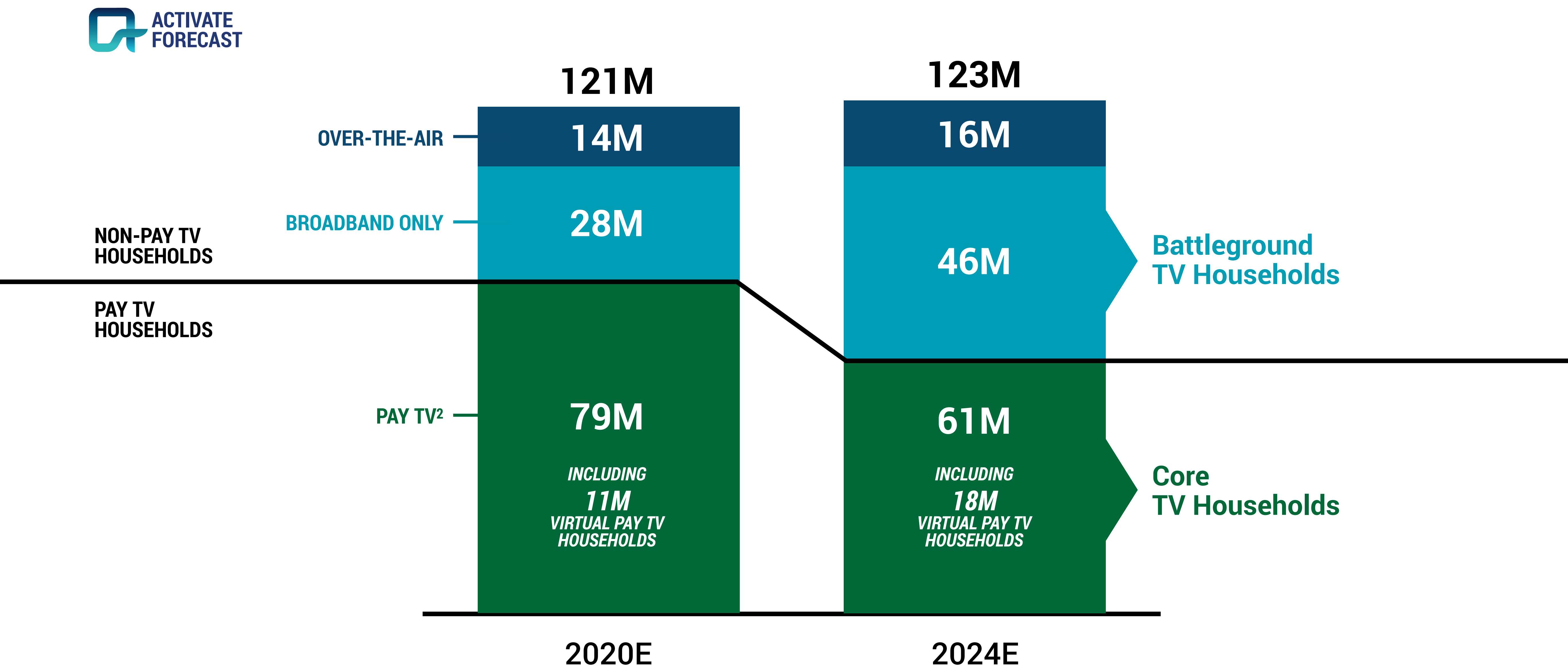
AVERAGE DAILY VIDEO TIME PER ADULT AGED 18+ BY TYPE, U.S., 2019 VS. 2020E VS. 2024E, HOURS:MINUTES



1. "Digital video" includes video watched on a mobile phone, tablet, laptop computer, desktop computer, or Connected TV. Connected TVs are TV sets that can connect to the internet through built-in internet capabilities (i.e. Smart TVs) or through another device such as a streaming device (e.g. Amazon Fire TV, Apple TV, Google Chromecast, Roku), gaming console, or Blu-ray player. 2. "Television" includes traditional live and time-shifted (e.g. DVR) television viewing.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Nielsen

By 2024, we forecast 46M Battleground TV Households, which will have broadband access only and not Pay TV

TELEVISION HOUSEHOLD BREAKDOWN[1], U.S., 2020E VS. 2024E, MILLIONS HOUSEHOLDS



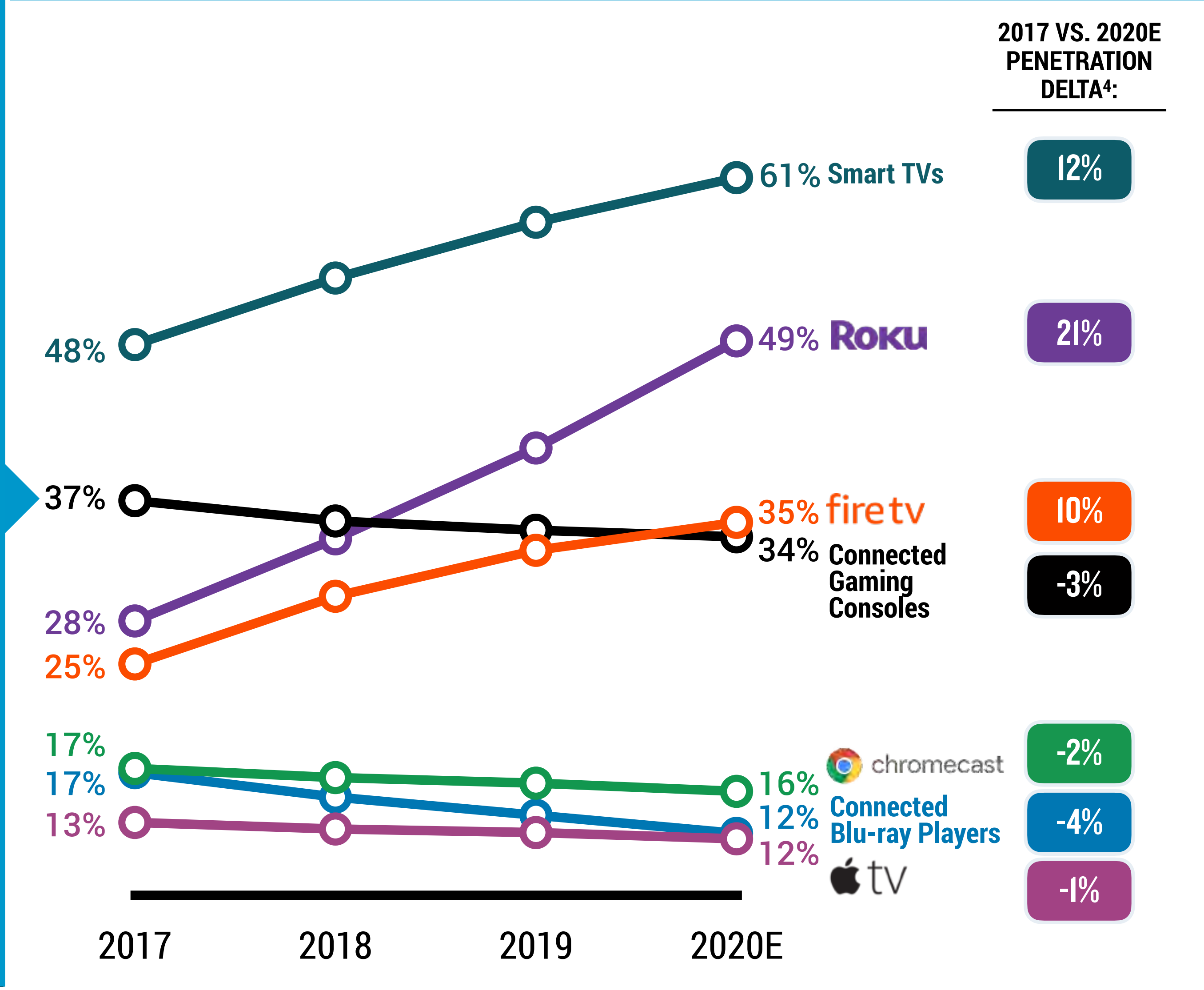
1. Figures do not sum due to rounding.
2. "Pay TV" includes traditional Pay TV households and virtual Pay TV households.

Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Leichtman Research Group, MoffettNathanson, Nielsen, Parks Associates, S&P Global, U.S. Census Bureau

Nearly all households will have a Connected TV by 2024

CONNECTED TV HOUSEHOLDS[1], U.S., 2017-2024E, MILLIONS

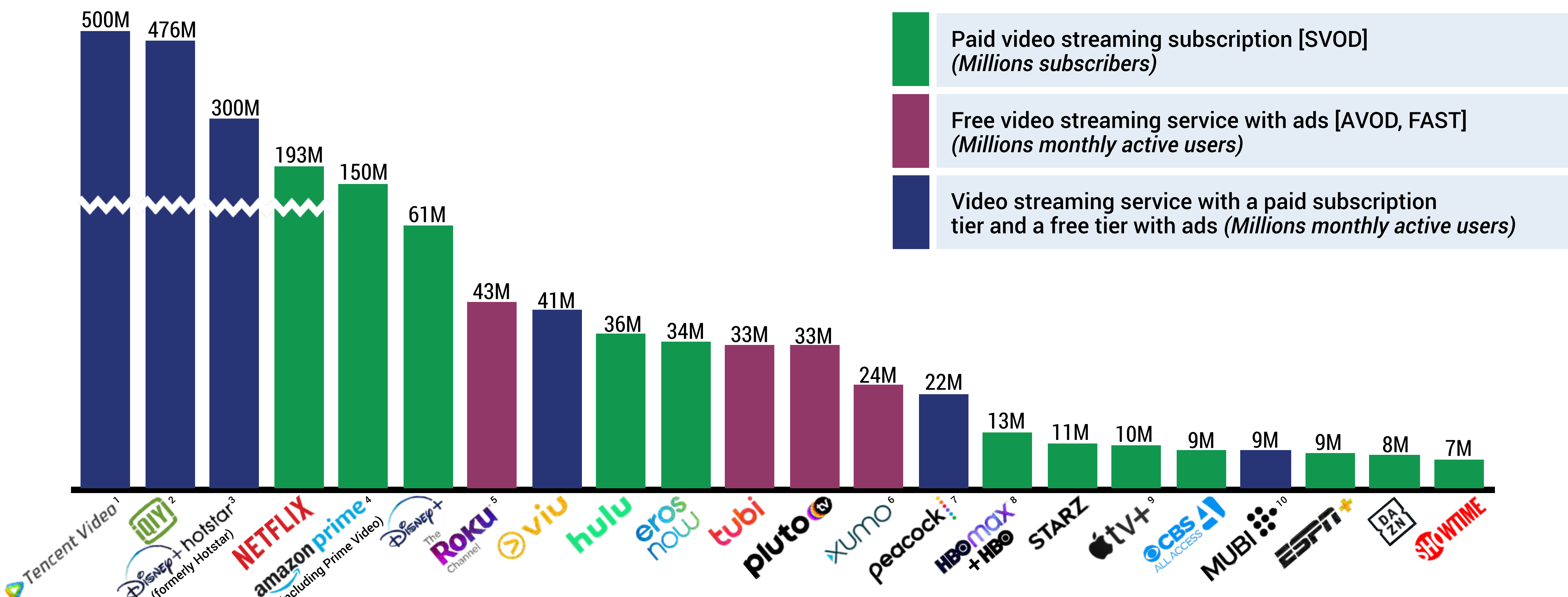
PENETRATION[2] BY SELECT CONNECTED TV DEVICES, U.S., 2017-2020E, % CONNECTED TV MONTHLY USERS[3]



Note: Connected TVs are TV sets that can connect to the internet through built-in internet capabilities (i.e. Smart TVs) or through another device such as a streaming device (e.g. Amazon Fire TV, Apple TV, Google Chromecast, Roku), gaming console, or Blu-ray player.
1. "Connected TV Households" include households for which at least one person of any age uses the internet through a Connected TV at least once per month. 2. "Penetration" is measured as consumers of any age who use the internet through the listed device at least once per month. 3. "Connected TV monthly users" include consumers of any age who use the internet through a Connected TV at least once per month. 4. Figures do not sum due to rounding.
Sources: Activate analysis, eMarketer

The streaming wars will be fought locally and globally

ESTIMATED NUMBER OF SUBSCRIBERS / USERS FOR SELECT MAJOR VIDEO STREAMING SERVICES,
GLOBAL, 2020 OR MOST RECENT, MILLIONS SUBSCRIBERS / MILLIONS MONTHLY ACTIVE USERS

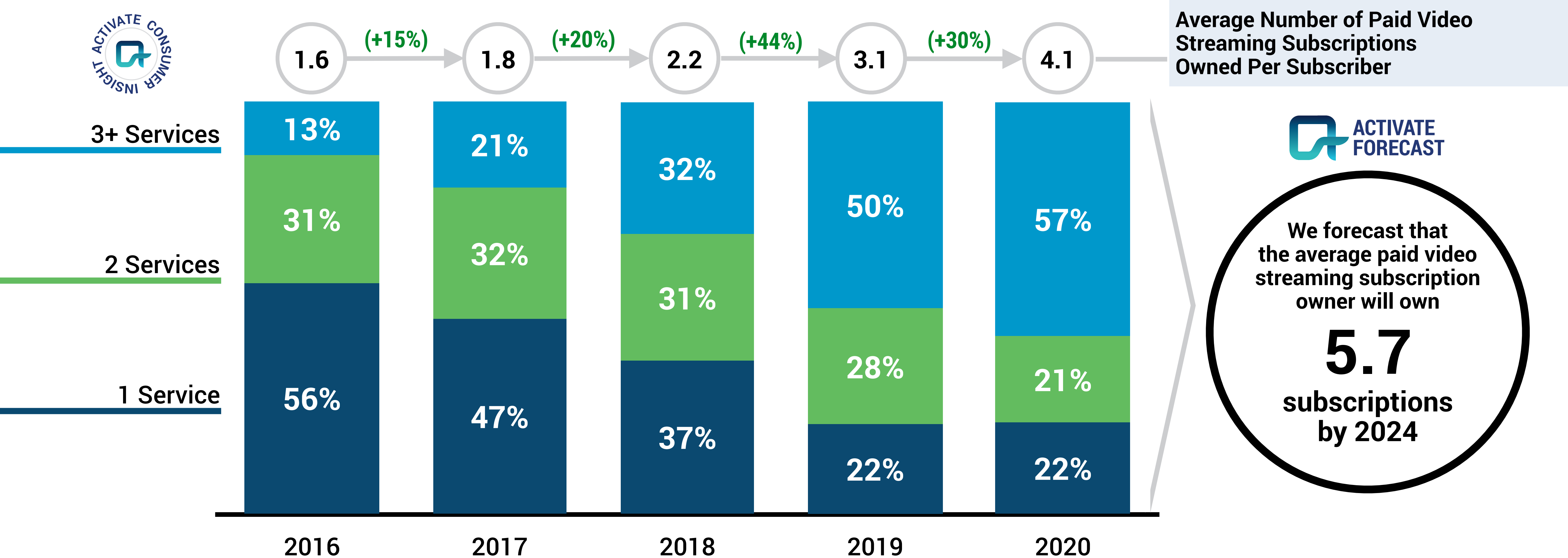


1. Reflects estimated monthly active users as no recent official numbers have been reported. 2. Reflects average monthly active users for 2019. 3. Reflects the most recently reported number of monthly active users as of Apr. 2019. 4. Subscriber count as of Q4 2019. 5. Reflects self-reporting that The Roku Channel reached active accounts with approximately 43 million people in Q2 2020. 6. Reflects U.S. monthly active users as reported in Sept. 2020. Although Xumo is also available internationally, global users were not reported. 7. Reflects the number of sign-ups for Peacock across the free and paid subscription tiers. 9. Reflects monthly active users as of Mar. 2019. 8. Does not include consumers subscribing to HBO / HBO Max through a Pay TV provider (e.g. purchasing the HBO add-on to a cable/satellite TV package and receiving HBO Max at no additional cost). Includes consumers subscribing to the HBO Max or HBO (formerly HBO Now) OTT service directly (e.g. subscribing to HBO Max through the service website) or through a non-Pay TV third party (e.g. subscribing to HBO through Amazon Prime Video Channels). 9. Represents estimated sign-ups for Apple TV+ as Apple has not released official subscriber counts. Does not represent all Apple device customers eligible for the 12-month free trial of the service. 10. Reflects the number of registered users on MUBI.

Sources: Activate analysis, Bloomberg, Business Insider, Business Wire, CNBC, Company filings, Company press releases, Company sites, Cord Cutters News, Deadline, Digiday, Digital TV News, eMarketer, FierceVideo, Media Play News, MediaPost, Multichannel News, nScreenMedia, TechCrunch, Variety, The Verge, The Washington Post

The average paid video streaming subscriber owns 4.1 subscriptions today; we forecast that this will increase to 5.7 subscriptions by 2024

NUMBER OF PAID VIDEO STREAMING SUBSCRIPTIONS OWNED PER SUBSCRIBER,
U.S., 2016-2020, % PAID VIDEO STREAMING SUBSCRIPTION OWNERS AGED 18+



Note: We have updated our methodology. We are now tracking paid video streaming subscription ownership, which includes subscriptions for which the consumer's household is paying as well as subscriptions that the consumer's household is receiving for free through a promotion[1]. Ownership does not include paid video streaming subscriptions that are being accessed by borrowing the account credentials of someone who is not a member of the consumer's household.

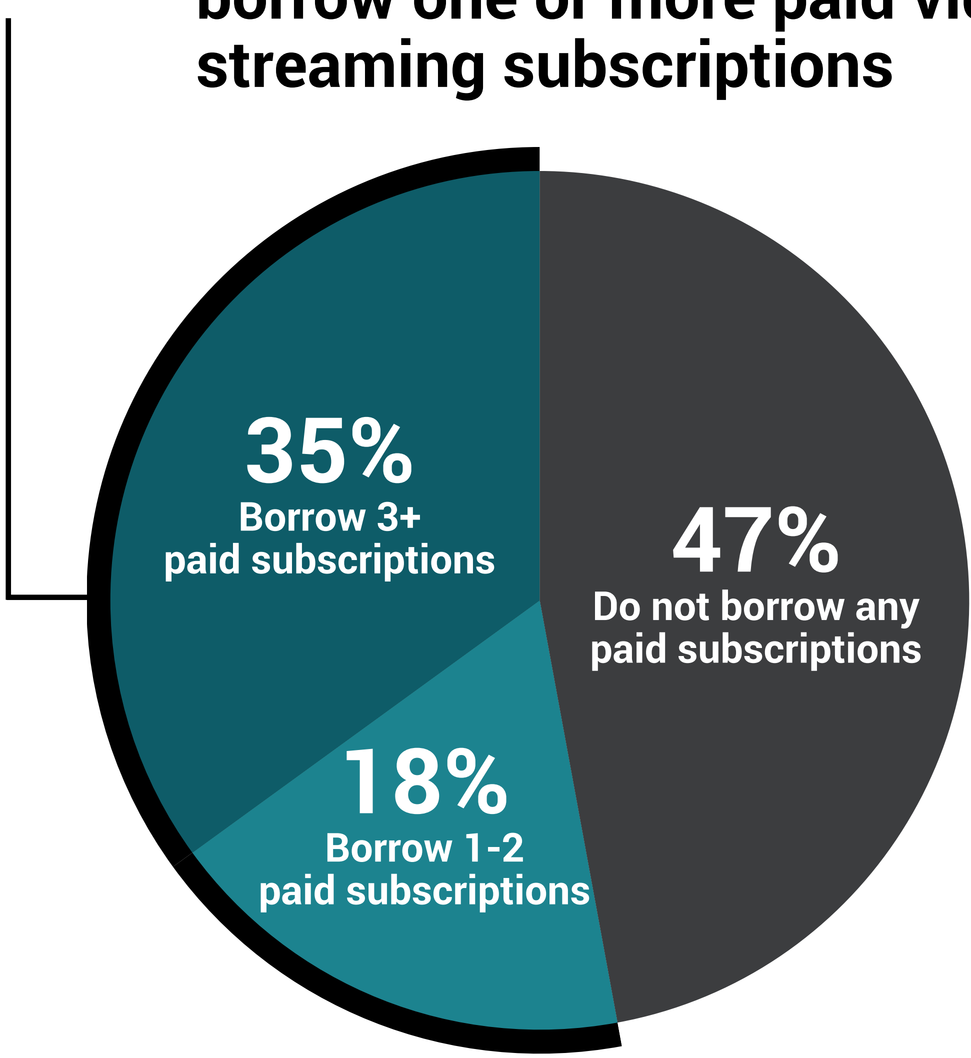
1. Examples of such promotions include: a Disney+ subscription received for free through a Verizon mobile plan, an Apple TV+ subscription received for free through an Apple device purchase.

Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n = 4,000), Activate 2017 Consumer Tech & Media Research Study (n = 4,047), Activate 2018 Consumer Tech & Media Research Study (n = 4,000), Activate 2019 Consumer Tech & Media Research Study (n = 4,006), Activate 2020 Consumer Tech & Media Research Study (n = 4,003), PricewaterhouseCoopers, U.S. Bureau of Labor Statistics

Paid video streaming subscribers are also watching video for free – many are borrowing passwords from friends and using free, ad-supported services

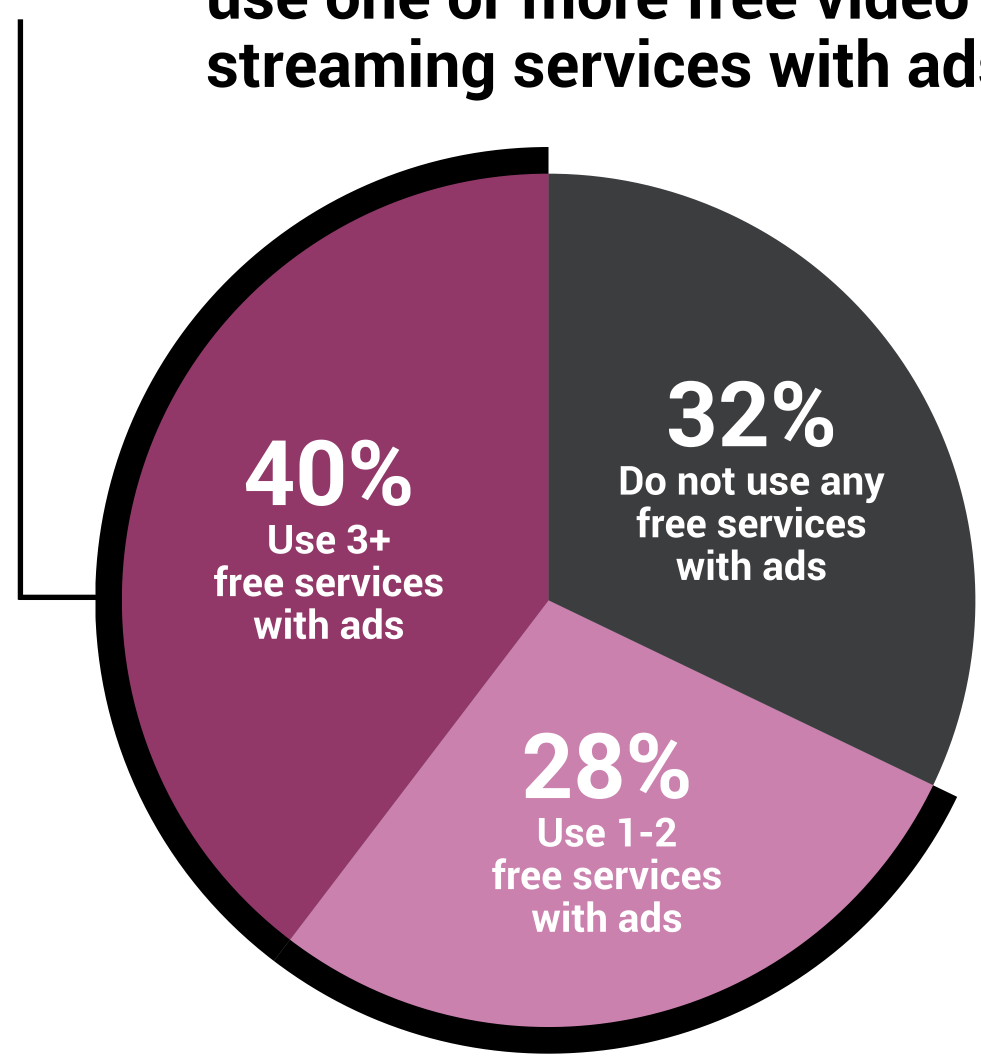
NUMBER OF PAID VIDEO STREAMING SUBSCRIPTIONS BORROWED[1] PER ADULT AGED 18+, U.S., 2020, % PAID VIDEO STREAMING SUBSCRIPTION OWNERS

53% of paid video streaming subscriptions owners **borrow one or more paid video streaming subscriptions**



NUMBER OF FREE VIDEO STREAMING SERVICES[2] WITH ADS USED PER ADULT AGED 18+, U.S., 2020, % PAID VIDEO STREAMING SUBSCRIPTION OWNERS

68% of paid video streaming subscriptions owners **use one or more free video streaming services with ads**



1. "Borrowing" a paid video streaming subscription is defined as accessing the subscription by borrowing the credentials of someone who is not a member of the household. 2. YouTube and Twitch excluded due to emphasis on user-generated video.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

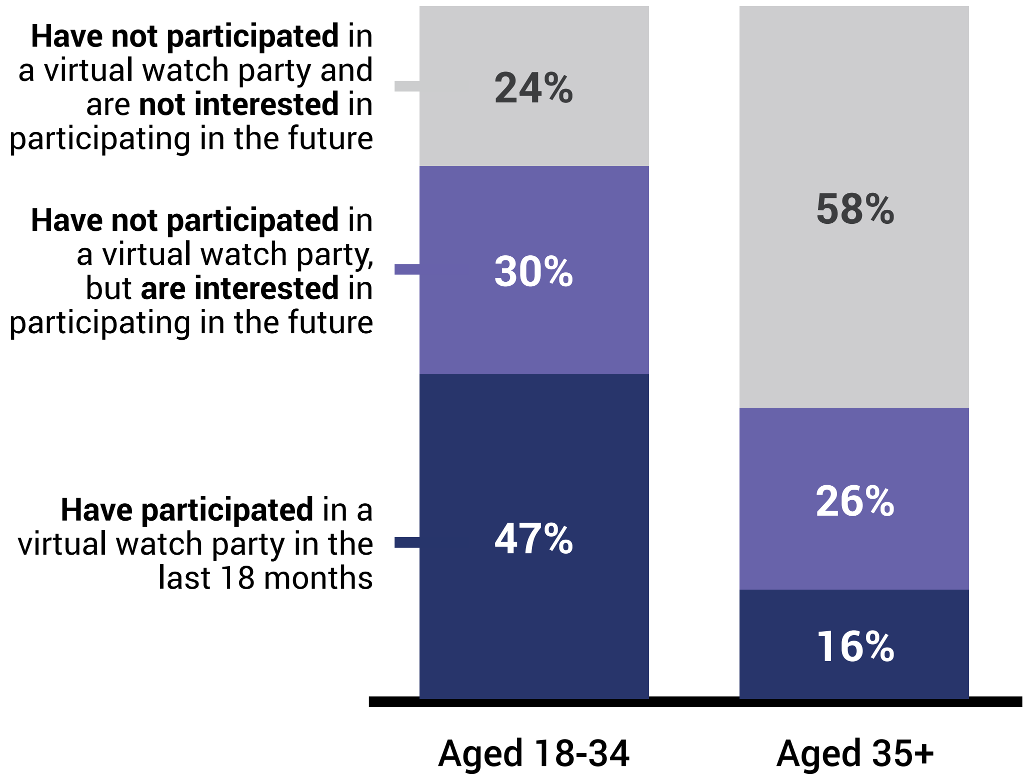
Enhancements to the video streaming experience have the potential to drive more usage; virtual watch party features made video viewing a shared experience while people were sheltering in place

PARTICIPATION AND INTEREST IN VIRTUAL WATCH PARTIES BY AGE GROUP[1], U.S., 2020, % VIDEO VIEWERS[2] AGED 18+

ACTIVATE CONSUMER INSIGHT

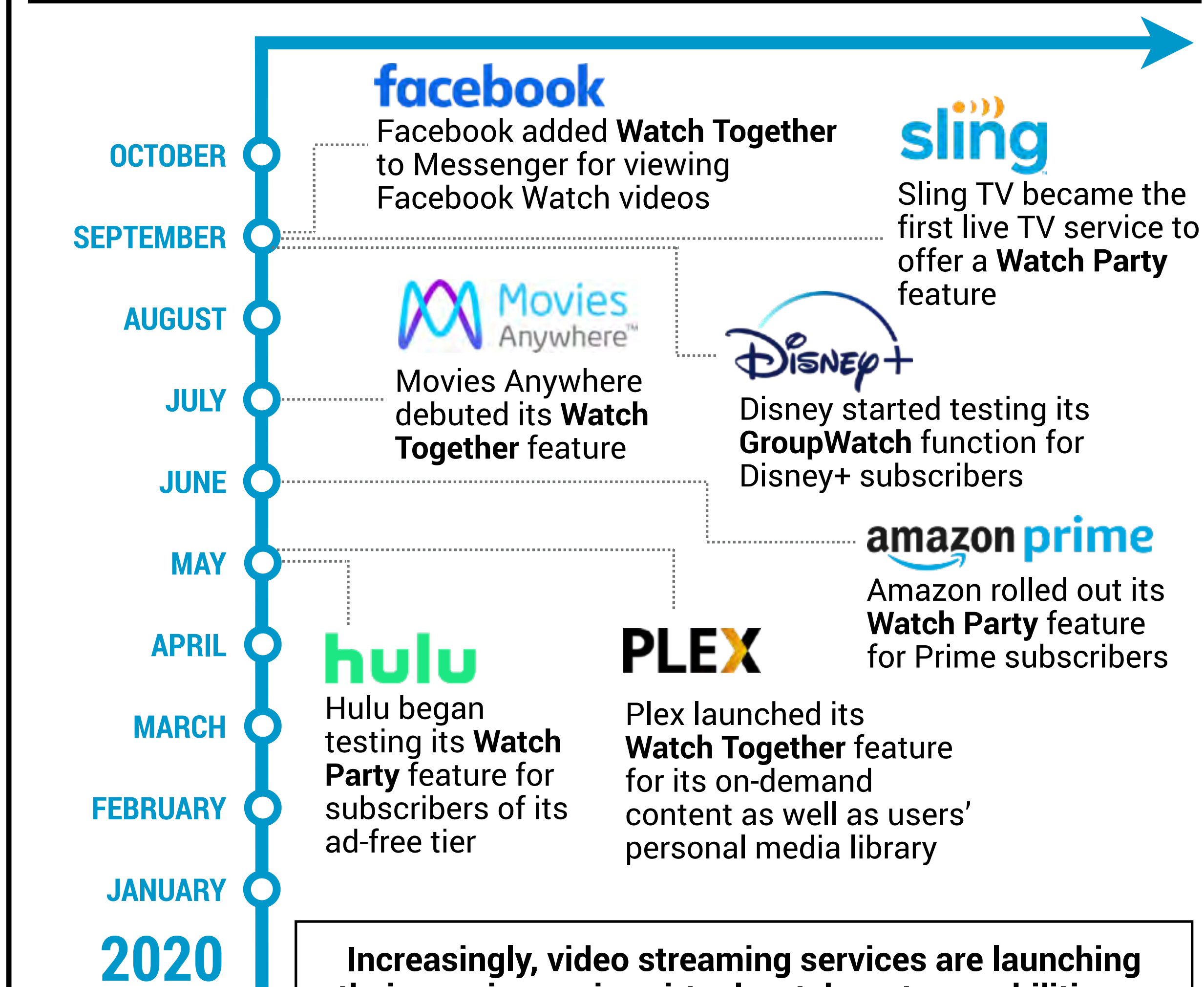
VIRTUAL WATCH PARTIES

Tools that synchronize video streaming to allow groups of viewers to watch the exact same movie / TV show online at the exact same time while in different locations



77% of video viewers[2] aged 18-34 have already participated in a virtual watch party or are interested in participating in the future

SELECT VIRTUAL WATCH PARTY FEATURES LAUNCHED IN 2020



Increasingly, video streaming services are launching their own in-service virtual watch party capabilities — prior to 2020, watch parties were offered primarily through third parties such as Scener and Netflix Party

1. Figures do not sum to 100% due to rounding. 2. "Video viewers" are defined as consumers who watch movies / TV shows.
Sources: Activate analysis, Activate 2020 Consumer Connectivity & Video Research Study (n = 2,123), Company sites, Deadline, Digiday, Engadget, FierceVideo, TechCrunch, Variety, The Verge

Interactive titles and augmented reality will pave the way for video streaming to approximate a video gaming experience

SELECT NEXT GENERATION VIDEO STREAMING SERVICE FEATURES

INTERACTIVE TITLES

MOVIES / TV SHOWS THAT ALLOW THE VIEWER TO MAKE CHOICES THAT INFLUENCE THE NARRATIVE

NETFLIX

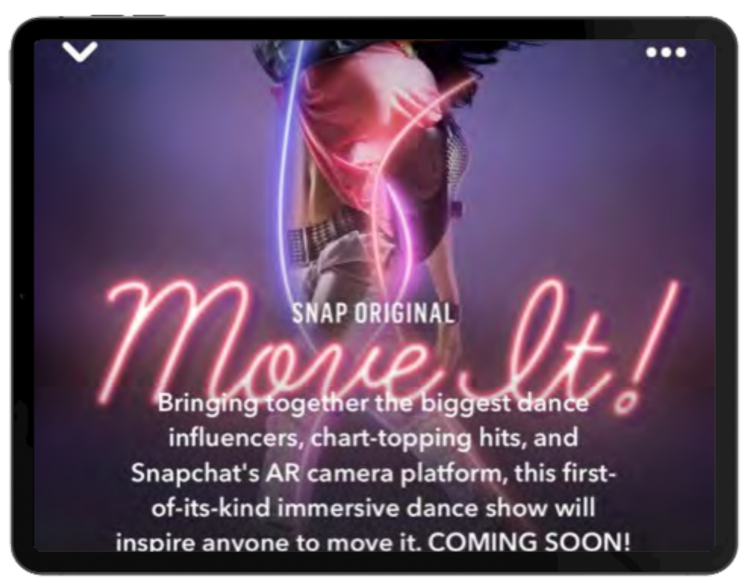
Since 2017, Netflix has released several interactive titles, including Black Mirror: Bandersnatch, which allow viewers to participate in what they are watching

Black Mirror: Bandersnatch
Released 2018

AUGMENTED REALITY CONTENT

CONTENT THAT USES AUGMENTED REALITY (AR) TECHNOLOGY TO PLACE THE VIEWER INTO THE MOVIE / TV SHOW

Snapchat has increasingly been adding AR capabilities that put viewers into its Originals; this includes Move It!, which will track viewers' movements as they learn dances



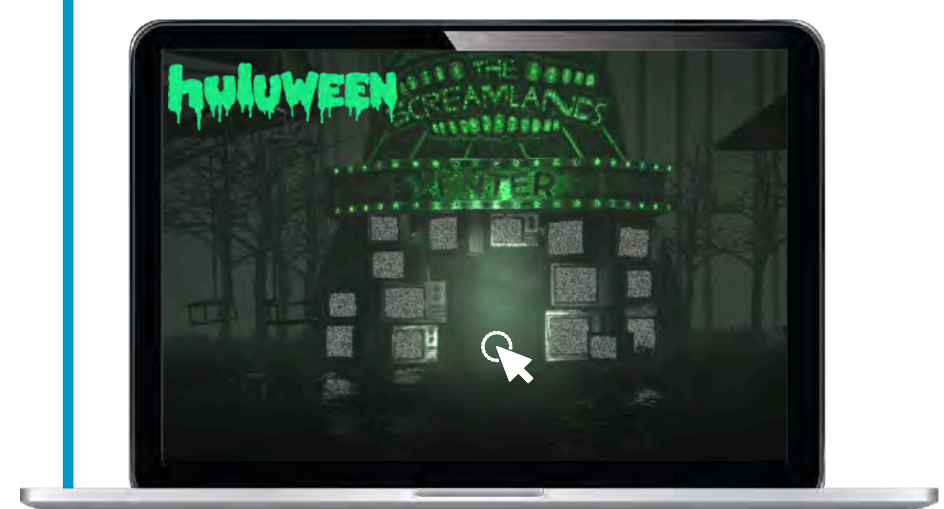
Move It!
Announced 2020

VIRTUAL EXPERIENCES

IMMERSIVE EXPERIENCES IN WHICH THE USER CAN EXPLORE AND INTERACT WITH AN ONLINE WORLD

hulu

As part of its annual Halloween event, Hulu has launched The Screamlands, a virtual haunted house experience with five different themed rooms that users can tour



The Screamlands
Launched 2020

Sources: Activate analysis, Company press releases, Company sites, Deadline, Digiday, Variety, The Verge

As consumers use more video streaming services, there is an increasing need for aggregators to unify the user experience

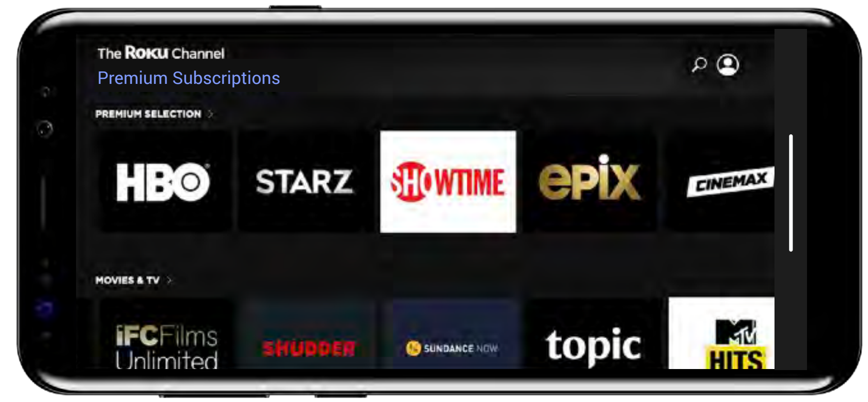
VIDEO STREAMING SERVICE AGGREGATORS

Video Streaming Hubs

Allow consumers to subscribe to, manage, and watch multiple video streaming services through a single website/app

Example Players

tv channels
prime video CHANNELS
The Roku Channel
hulu



Video Streaming Guides

Allow consumers to browse, search, and/or receive recommendations across multiple video streaming services through a single website/app

Example Players

JustWatch
Reelgood
DECIDER
Yidio
TV TIME
VUNIVERSE (BETA)
ON TV TONIGHT
LIKEWISE
TRAKT
watchworthy
MINNOW
Bingie
Letterboxd
taste
itcher

Sources: Activate analysis, Company press releases, Company sites, Digiday, FierceVideo, TechCrunch, The Verge

Web video will continue to be a large part of people's video viewing, driven by their dedication to web-native influencers and personalities

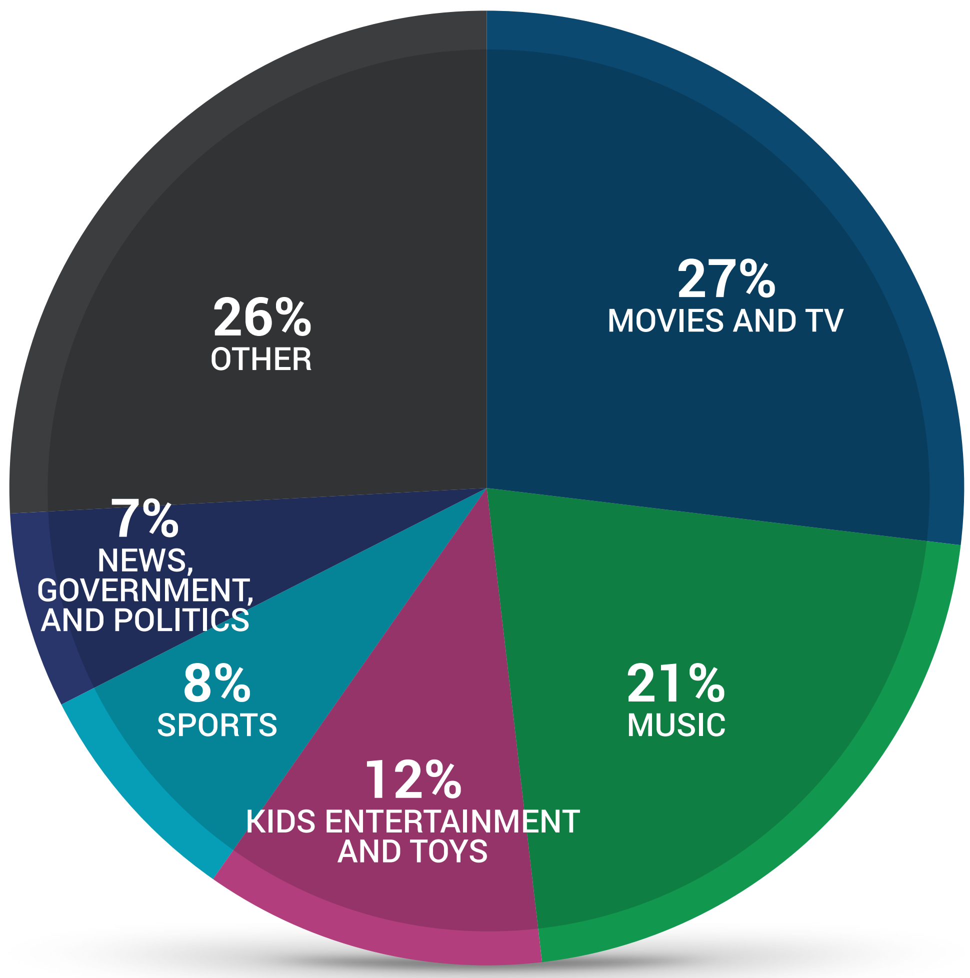
TOP INFLUENCERS ACROSS FACEBOOK AND YOUTUBE BY TOP GENRE[1], U.S., AUG. 2020, MILLIONS UNIQUE VIEWERS AGED 13+[2]

PEOPLE & BLOGS	RICK LAX 56M Unique Viewers	SAFAREE 56M Unique Viewers	ADLEY 46M Unique Viewers	JUSTIM FLOM 43M Unique Viewers	PAUL VU 37M Unique Viewers
MUSIC & DANCE	MICHAEL ANDREAS 38M Unique Viewers	CARDI B 38M Unique Viewers	TEDDY RILEY 29M Unique Viewers	ROD WAVE 20M Unique Viewers	YOUNG BUCK 20M Unique Viewers
KIDS ENTERTAINMENT & ANIMATION	KIDS DIANA SHOW 57M Unique Viewers	GIRLSTTOYZZ 34M Unique Viewers	VLAD AND NIKI 28M Unique Viewers	GENEVIEVE'S PLAYHOUSE 28M Unique Viewers	RYAN'S WORLD 25M Unique Viewers
ENTERTAINMENT	JULIUS DEIN 53M Unique Viewers	MRBEAST 34M Unique Viewers	DANCINGDAN 23M Unique Viewers	BIGDAWSTV 18M Unique Viewers	LANCE210 PRANKS 16M Unique Viewers

1. Top influencers determined by the number of deduplicated unique viewers across Facebook and YouTube based on 30-second views. Does not include accounts that primarily aggregate third-party, user-submitted content or memes. Top genres based on total unique viewers among the top 100 influencers. 2. Represents deduplicated unique viewers across Facebook and YouTube based on 30-second views.
Sources: Activate analysis, Tubular Labs

On YouTube, major media companies account for substantial viewership

SHARE OF YOUTUBE VIEWS OF U.S.-BASED MEDIA COMPANY PROGRAMMING BY CATEGORY[1,2], GLOBAL, YTD AUG. 2020, % VIEWS



TOP U.S.-BASED MEDIA COMPANY PAGES ON YOUTUBE BY CATEGORY[2,3], GLOBAL, AUG. 2020, MILLIONS UNIQUE VIEWERS

MOVIES AND TV

1 MOVIECLIPS	2 NETFLIX	3 THE TONIGHT SHOW STARRING JIMMY FALLON	4 WARNER BROS. PICTURES	5 ELLEN DEGENERES
135M UNIQUE VIEWERS	46M UNIQUE VIEWERS	37M UNIQUE VIEWERS	37M UNIQUE VIEWERS	30M UNIQUE VIEWERS

MUSIC

1 DISNEYMUSICVEVO	2 ULTRA MUSIC	3 ATLANTIC RECORDS	4 WORLDSTAR HIP HOP / WSHH	5 WARNER MÚSICA
85M UNIQUE VIEWERS	61M UNIQUE VIEWERS	55M UNIQUE VIEWERS	48M UNIQUE VIEWERS	42M UNIQUE VIEWERS

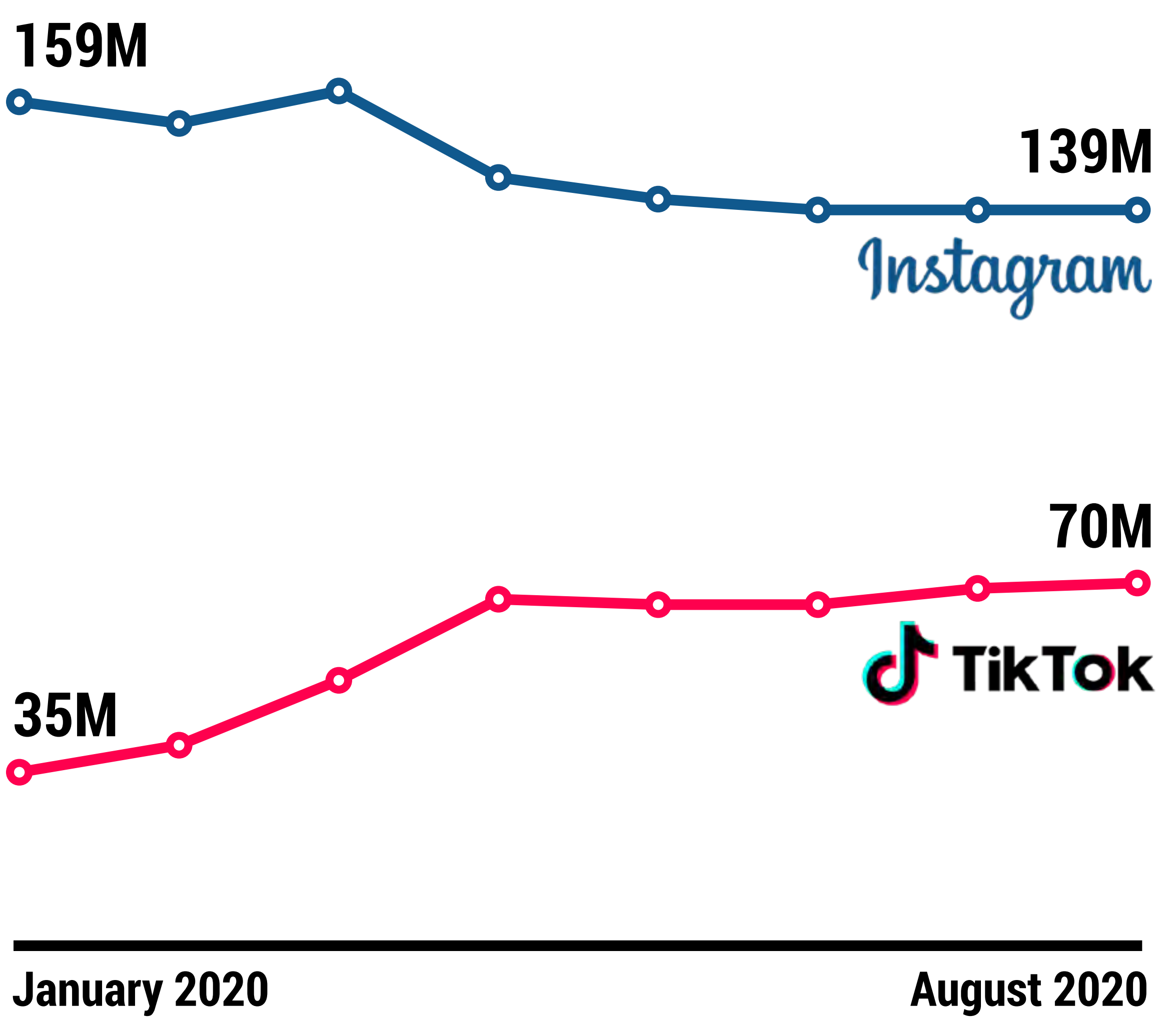
KIDS ENTERTAINMENT AND TOYS

1 COCOMELON - NURSERY RHYMES	2 PINKFONG! KIDS' SONGS & STORIES	3 LITTLE ANGEL: NURSERY RHYMES & KIDS SONGS	4 TALKING TOM	5 BABYBUS - NURSERY RHYMES
317M UNIQUE VIEWERS	197M UNIQUE VIEWERS	103M UNIQUE VIEWERS	96M UNIQUE VIEWERS	85M UNIQUE VIEWERS

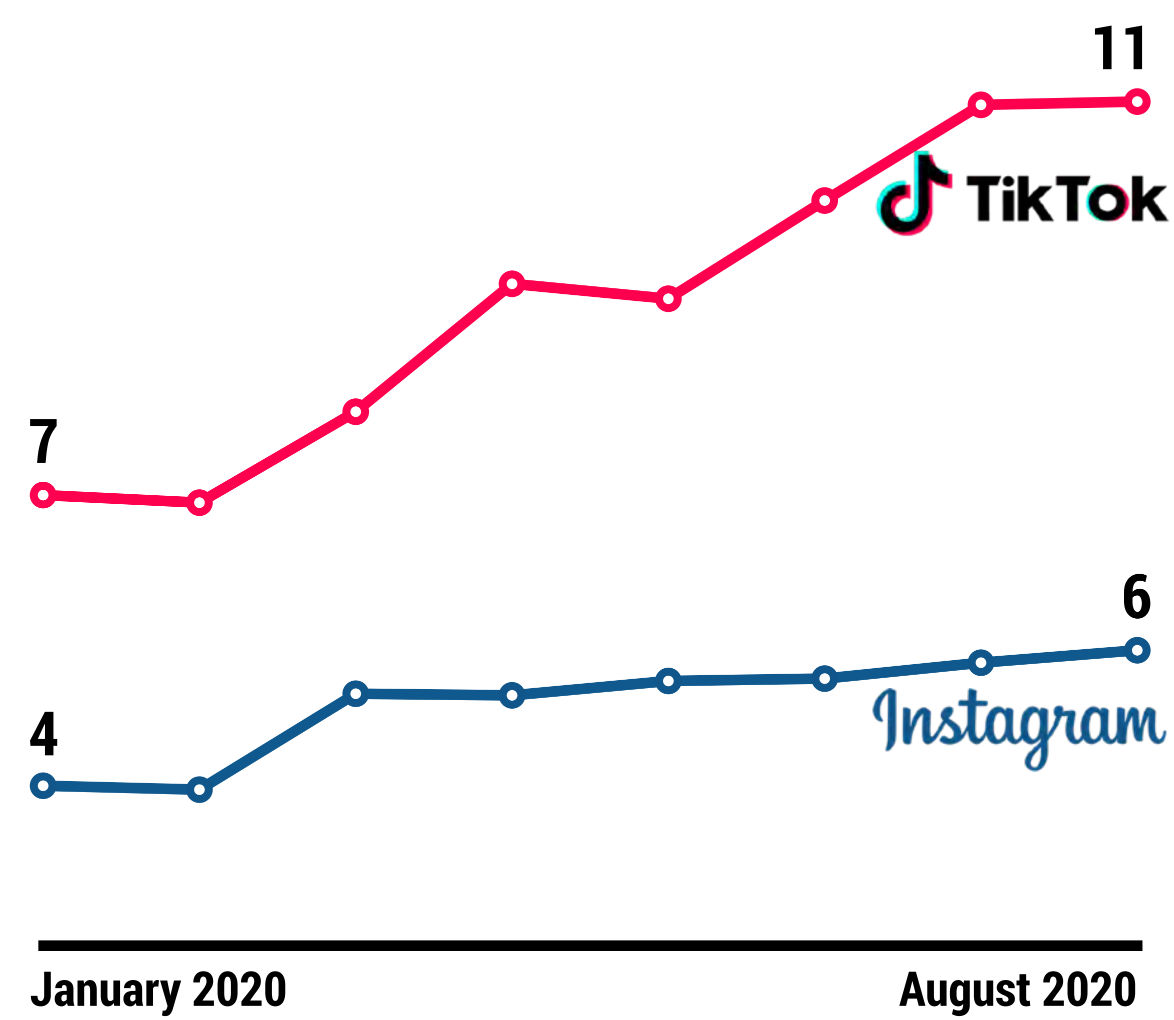
1. Based on YouTube's definition of views. Figures do not sum to 100% due to rounding. 2. "Media companies" are defined as organizations whose primary business model is in production and/or distribution of content (e.g. TV, movies, music, print, radio).
3. Top media company pages determined by the number of unique viewers on YouTube.
Sources: Activate analysis, Tubular Labs

TikTok has seen tremendous user and engagement growth in 2020

TOTAL UNIQUE VISITORS[1],
U.S., JAN. 2020-AUG. 2020, MILLIONS

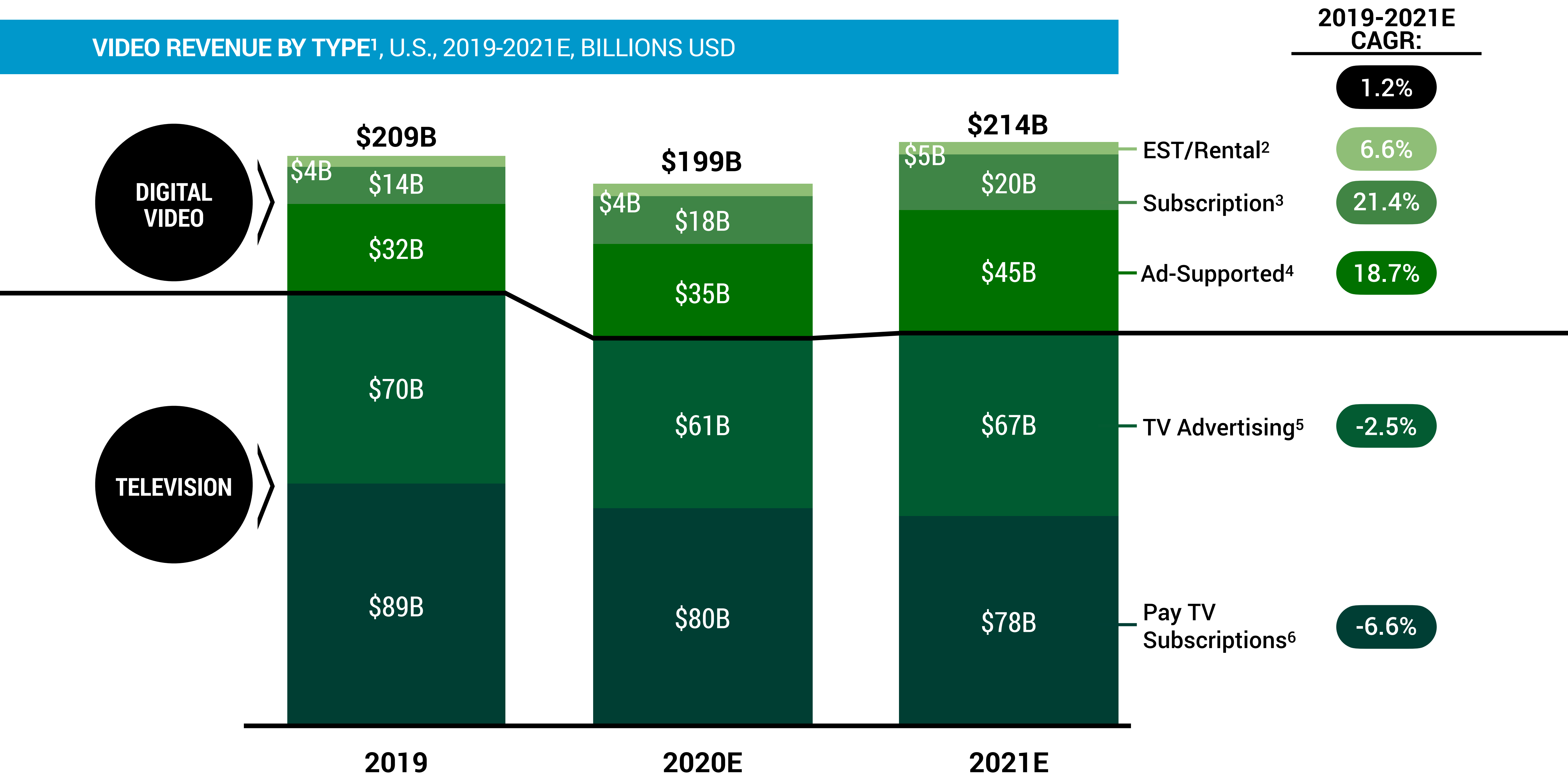


AVERAGE MONTHLY TIME SPENT PER VISITOR ON DESKTOP, MOBILE WEB, AND APP BY SOCIAL PLATFORM[1],
U.S., JAN. 2020-AUG. 2020, HOURS



1. Desktop users aged 2+ and mobile (i.e. smartphone, tablet) users aged 13+.
Sources: Activate analysis, Comscore

Though digital video is drawing significant consumer spend and attention, most of the dollars in video will still be in television



1. Figures do not sum due to rounding. 2. Includes spend on online video on-demand transactions (e.g. purchases and rentals). 3. Includes spend on paid video streaming subscriptions. 4. Includes in-stream video advertising (e.g. pre-roll, mid-roll, post-roll) on digital video content, including on social networks, and out-stream video advertising (e.g. native, in-feed, in-article, in-banner, interstitial). 5. Includes advertising on broadcast TV and Pay TV. 6. Includes revenue from Pay TV subscriptions.
Sources: Activate analysis, Digital TV Research, eMarketer, PricewaterhouseCoopers, Statista

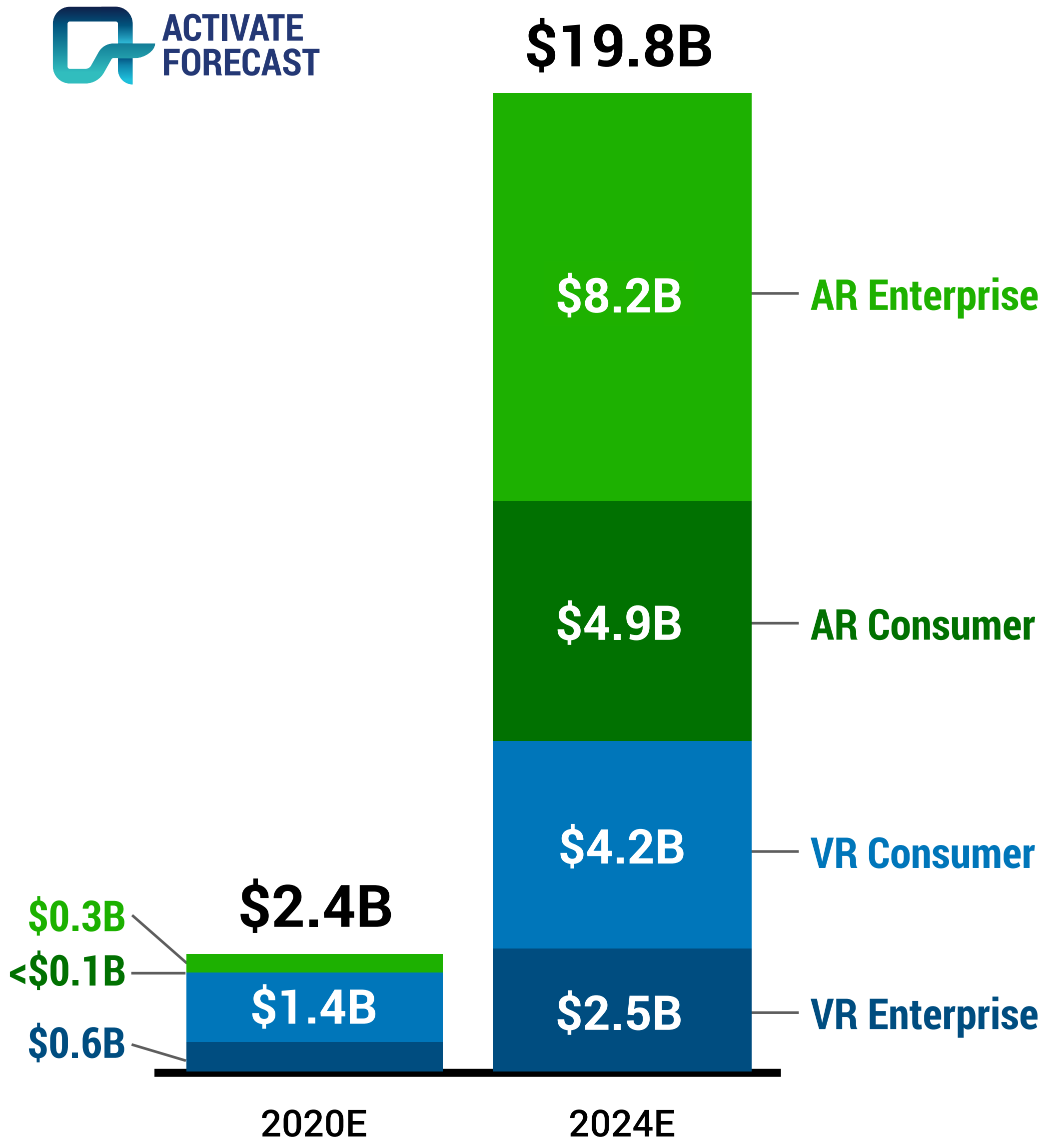
CONTENTS

activate consulting
www.activate.com

We forecast that the Augmented Reality (AR) / Virtual Reality (VR) market will reach roughly $20B by 2024

CONSUMER AND ENTERPRISE SPEND[1] ON AR/VR, U.S., 2020E VS. 2024E, BILLIONS USD

ACTIVATE FORECAST



What would you have to believe?

Virtual Reality (VR)

- **VR technology** matures and **pricing** remains at reasonably low levels
- **Standalone VR headsets**, which improve the user experience, capture a greater share of total unit sales
- A **robust content ecosystem** for VR headsets is available and encourages spending
- VR adoption primarily serves **gaming use cases** for consumers, but also increases usage and adoption for **non-gaming activities**

Augmented Reality (AR)

- **AR technology**, **form factor**, and **price** improve sufficiently to overcome adoption barriers
- At least one **major technology company** launches an AR headset and achieves **broad consumer adoption**
- **Initial models of consumer AR glasses** are paired with smartphones, **similar to other wearables**
- **Investment in enterprise-focused AR** increases, spurring **hardware adoption** and **software development** for an array of use cases and specialized applications

Excluded from sizing:

- Mobile AR
- Data
- Advertising
- Peripherals
- Headsets with no built-in technology[2]

1. Excludes revenues associated with mobile AR, data, advertising, and peripherals.
2. Excludes Google Cardboard and other headsets with no built-in technology.

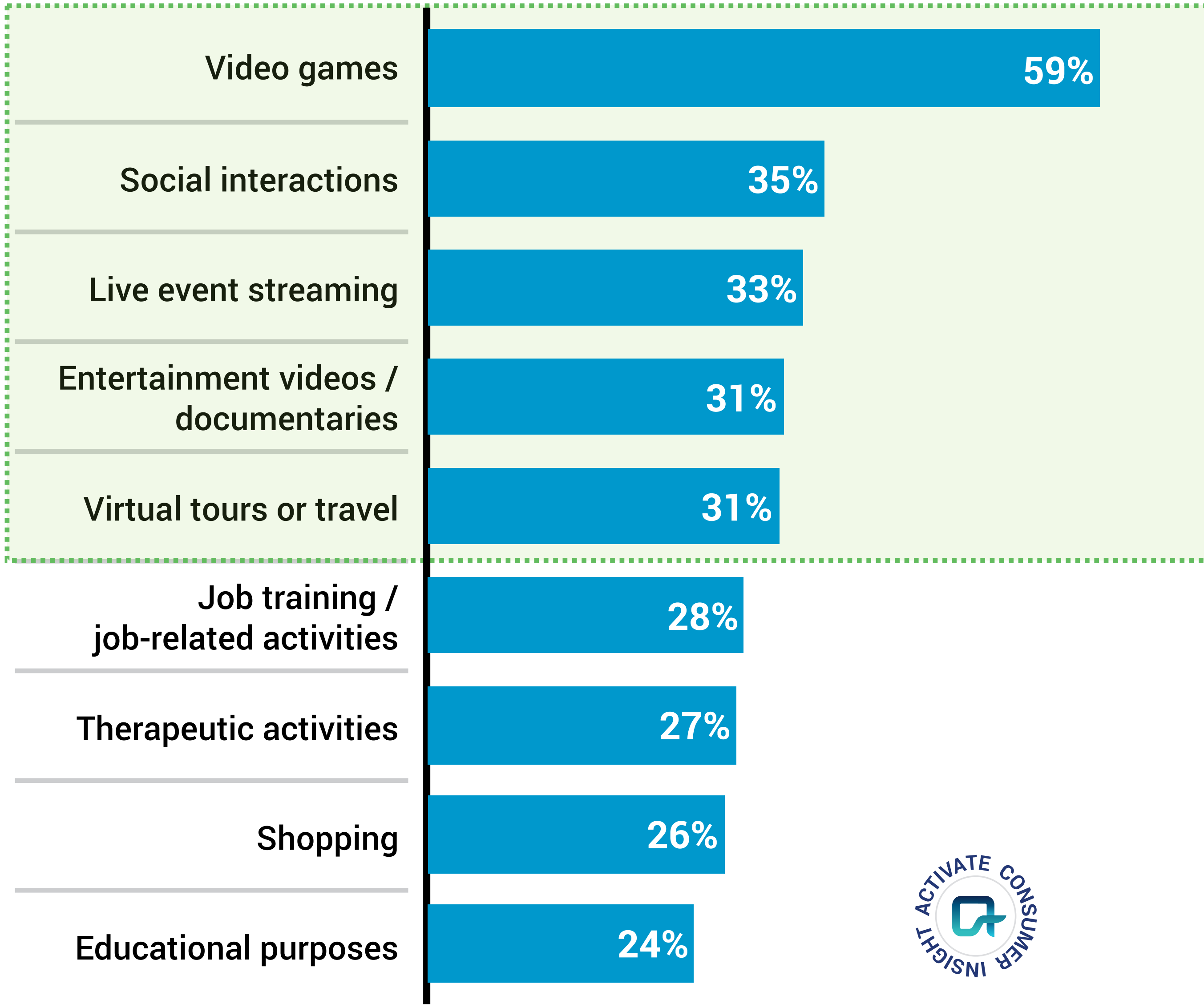
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), AR Insider, ARtillery Intelligence, Company press releases, Company sites, eMarketer, IDC, Morgan Stanley Research, PricewaterhouseCoopers, Road to VR, Sensor Tower, Statista, Steam Spy, Strategy Analytics, SuperData, VGChartz

VR has experienced increased adoption during the COVID-19 outbreak; beyond video games, VR has replaced a broad set of physical experiences and has also become a social platform

56% of VR headset purchasers **bought a headset** during the COVID-19 outbreak[1]

22% of VR headset purchasers **bought their first headset** during the COVID-19 outbreak[1]

REASONS FOR PURCHASING A VR HEADSET DURING THE COVID-19 OUTBREAK[1], U.S., 2020, ADULTS AGED 18+ WHO PURCHASED A VR HEADSET DURING THE COVID-19 OUTBREAK[1]



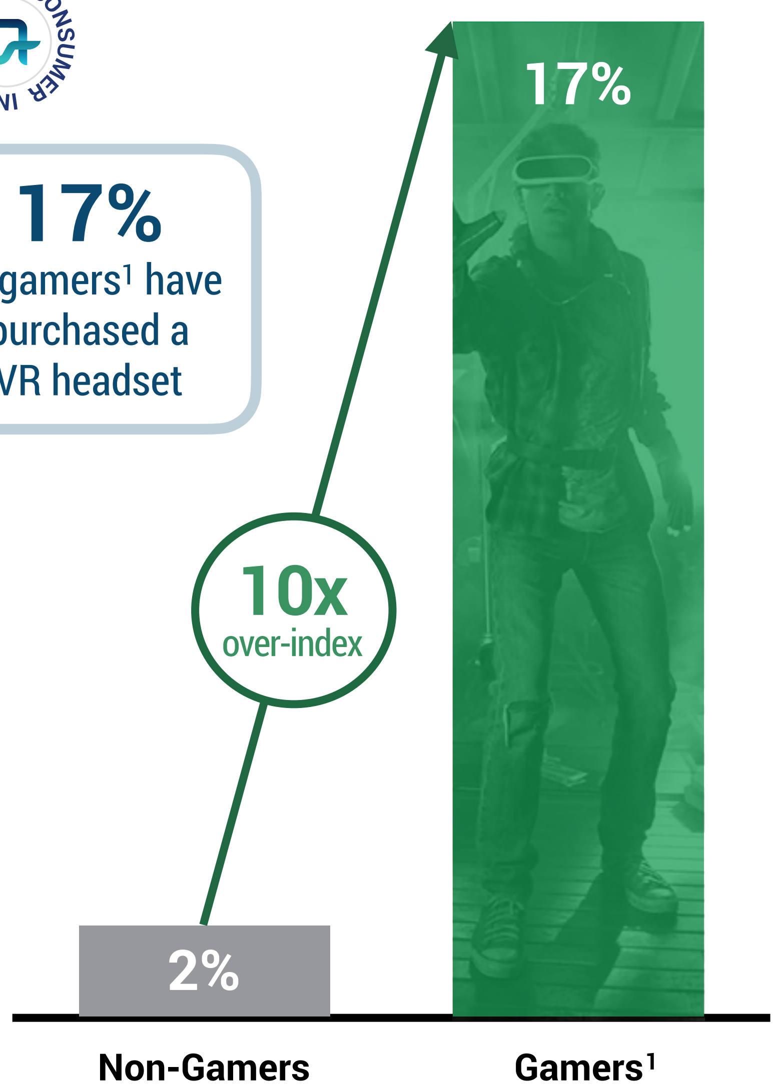
1. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). Includes pre-orders.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

The vast majority of VR headset purchasers are gamers, who are using the headsets for an enhanced video game experience

VR HEADSET PURCHASING BEHAVIOR, U.S., 2020, % ADULTS AGED 18+

ACTIVATE CONSUMER INSIGHT

17% of gamers[1] have purchased a VR headset



96% of VR headset purchasers are gamers[1]

VR HEADSET PURCHASERS ARE CONSOLE GAMERS

89% of VR headset purchasers also play video games on gaming consoles[2] (compared to 31% for those who have not purchased a VR headset)

VR HEADSET PURCHASERS ARE VIDEO GAME SUPER USERS

VR headset purchasers **spend an average of $17/month more on video games** than gamers who have not purchased a VR headset

VR headset purchasers also **spend an average of 13 hrs/month more playing video games** than gamers who have not purchased a VR headset

1. "Gamers" are defined as adults 18+ who currently play video games. 2. "Gaming consoles" include handheld consoles (e.g. Nintendo 3DS) and traditional consoles (e.g. PlayStation 4).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, Nielsen, PricewaterhouseCoopers

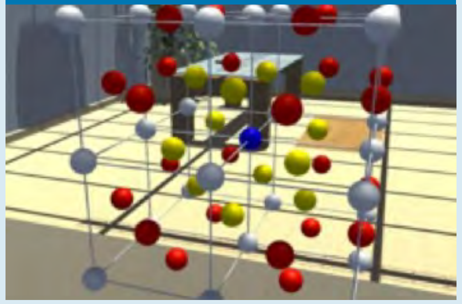
VR's primary strength is for immersive activities; users are very willing to try use cases outside of gaming

SELECT NON-GAMING VIRTUAL REALITY HEADSET USE CASES

>60%

of monthly active VR headset purchasers[1] aged 18+ use their headsets for **activities other than gaming**

EDUCATIONAL PURPOSES



ENTERTAINMENT VIDEOS / DOCUMENTARIES

LIVE EVENT STREAMING

SHOPPING

THERAPEUTIC ACTIVITIES

SOCIAL INTERACTIONS

VIRTUAL TOURS OR TRAVEL

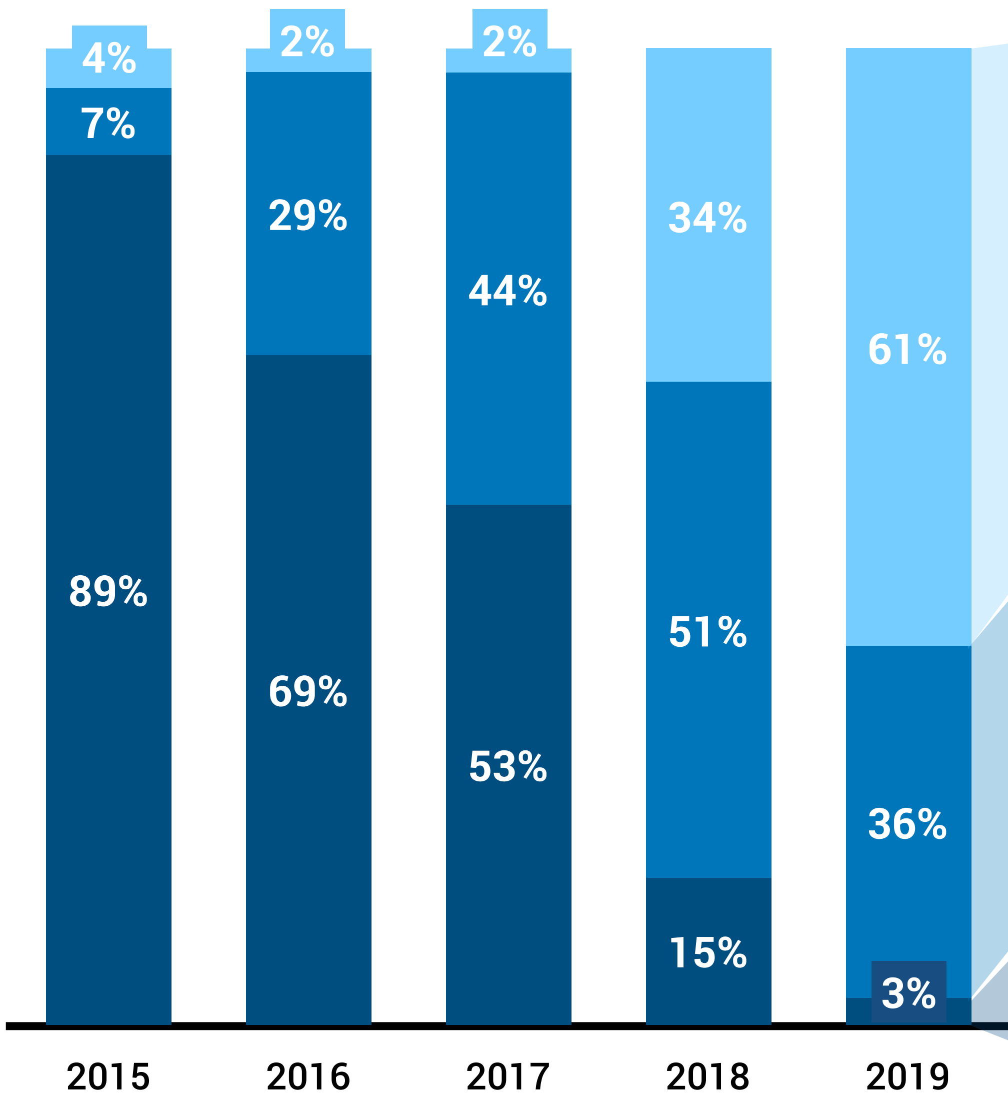
JOB TRAINING / JOB-RELATED ACTIVITIES

1. "Monthly active VR headset purchasers" are defined as adults aged 18+ who purchased a VR headset and who currently use the headset at least once per month.

Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

We believe that the shift in consumer VR adoption from screenless viewers to standalone headsets will continue

CONSUMER VR HEADSET SHIPMENTS BY TYPE[1], U.S., 2015-2019, % SHIPMENTS



Standalone Headsets

Fully functional headset **without the need for an external computing device**

Tethered Headsets

Headset **powered by an external computing device** (e.g. PC, gaming console) with a built-in display screen

Screenless Viewers[2]

Headset that requires **a separate device for a display screen** (e.g. smartphone)

1. Figures do not sum to 100% due to rounding.
2. Excludes headsets with no built-in technology, such as Google Cardboard.
Sources: Activate analysis, Company sites, IDC, VentureBeat, Virtual Perceptions, Wareable

Standalone headsets provide a superior experience for users and address key limitations of tethered headsets and screenless viewers

	How Standalone Headsets[1] Create a Superior User Experience	Advantage over Tethered Headsets[2]	Advantage over Screenless Viewers[3]
No Wires	• No cables required • No need to carry an external device • Ability to use and set up anywhere	✓	
No Hardware Requirements	• Built-in screen, processors, and storage • No external PC/console required, which can present additional costs	✓	✓
Frees Up User Devices	• Does not drain smartphone battery • Consumer can continue to use their smartphone simultaneously		✓
Better Visuals than Phone Display	• Higher display speeds • Clearer graphics • VR-optimized chips for video processing		✓

Standalone headsets[1] have been a significant factor in the improvement of the VR user experience

Standalone headsets[1] are driving further consumer adoption of VR (growing to 61% of U.S. VR headset shipments in 2019 from 2% in 2017)

1. "Standalone headset" is defined as a headset that is fully functional without the need to be tethered to another computing device (e.g. Oculus Quest). 2. "Tethered headset" is defined as a headset that has a screen but relies on another computing device to function (e.g. PC, gaming console). 3. "Screenless viewer" is defined as a headset that relies on a separate device for a screen (e.g. phone). Excludes headsets such as Google Cardboard with no built-in technology.
Sources: Activate analysis, Company sites, IDC, VentureBeat, Virtual Perceptions, Wareable

VR will see additional growth from technology improvements specific to VR as well as more general technology developments, such as 5G connectivity and improved batteries

SCREEN QUALITY

KEY IMPROVEMENT AREAS	Display resolution (e.g. 2K, 4K, 8K) Field of view (e.g. 90° view) Image quality (e.g. MicroLEDs, OLEDs)[1]
END-USER IMPACT	Improved image quality Greater perception of immersion
EXAMPLE EFFORTS	VR Headsets: Pimax, hp, VARJO, XTAL, STARVR

SOFTWARE-BASED VISUAL IMPROVEMENT

KEY IMPROVEMENT AREAS	Eye tracking Automated IPD[2] calculation
END-USER IMPACT	Improved image quality Reduced chance of nausea Extended functionalities (e.g. eye-based navigation)
EXAMPLE EFFORTS	Eye Tracking: tobii, FOVE, SMI (acquired by Apple) Research Labs: FACEBOOK Research, Universities

CONNECTIVITY

KEY IMPROVEMENT AREAS	Connections with high bandwidth Connections with low latency Remote storage and compute
END-USER IMPACT	Improved image quality Reduced vision lag Lighter weight headsets (e.g. remote storage)
EXAMPLE EFFORTS	5G: verizon, AT&T, T-Mobile Cloud: amazon web services, Azure Peripherals for Wireless Play: TPCAST, DisplayLink

ENERGY EFFICIENCY

KEY IMPROVEMENT AREAS	Battery life (while retaining low size and weight) Processor efficiency Foveated rendering (i.e. natural blur)
END-USER IMPACT	Longer sessions of usage Lighter weight headsets
EXAMPLE EFFORTS	Battery Peripherals: VR POWER Research Labs: FACEBOOK Research, Universities Processors: NVIDIA, AMD

1. Other elements of image quality include subpixel count, pixel density, subpixel layout (e.g. RGB Stripe vs. Pentile), and more.
2. "IPD" refers to inter-pupillary distance, which is the physical distance between the user's pupils.

Sources: Activate analysis, Ars Technica, Company press releases, Company sites, Digital Trends, Forbes, SPIE, TechRadar, University of Rochester, The Verge, Wareable

AR has massive potential to augment smartphones (similar to smartwatches) through increased integrations between the real world and the digital world

AR ROADMAP

TODAY

NICHE TOOLSET

DIFFERENTIATING FUNCTIONALITY

- **Apps on smartphones using the phone screen and camera(s)**
- **Tracking and mapping environment**[1]
- **Facial recognition**
- **Physics engines / light estimation**

APPLICATIONS

- **Games anchored in the real world** (e.g. Minecraft on a table)
- **Retail** (e.g. ability to digitally try on clothes and place furniture before purchase)
- Ability to apply **filters to face**
- **Visual search** (using phone's camera to identify items)

EXAMPLES (Lenses) wayfair (Furniture placement) Pokémon GO

ENTERPRISE / FIRST ADOPTER TOOL

DIFFERENTIATING FUNCTIONALITY

- **Headsets allowing free use of hands and a larger field of view vs. phone** (but often bulky)
- Significant increases in **reliability, durability, and accuracy**
- **Improved integration of digital and physical data** (e.g. precise overlays for surgeons)

APPLICATIONS

- **Enterprise applications** where overlaid content significantly enhances performance (e.g. surgery, oil & gas fieldwork, assembly lines)

EXAMPLES VUZIX Microsoft HoloLens

SMARTPHONE REPLACEMENT/ COMPANION

DIFFERENTIATING FUNCTIONALITY

- **Headsets either augmenting or replacing smartphones**
- **Integrating other technologies and connectivity**: 5G, IoT, data contextualization via AI, etc.
- **Lower price and improved form factor**
- **Usability improvements**: longer battery life, improved field of view **via consumer headsets**

APPLICATIONS

- Consumer-specific applications: **communication, navigation, fitness, real-time health diagnostics**, etc.
- **Multiple virtual screens** that can be overlaid on any surface
- **Intuitive 3D data modeling** (e.g. weather, traffic)

EXAMPLES *Not yet developed*

1. 6DoF (6 degrees of freedom, which includes x, y, z, roll, pitch, yaw) tracking enabled by SLAM (simultaneous location and mapping). Pokémon Go originally did not map environment, but used GPS as a rough approximation. Current versions can map to the environment.

Sources: Activate analysis, KGOnTech Blog, TechCrunch, The Verge

Consumer-grade AR headsets are not there as of yet – most of the big tech firms are working to refine price, design, and technology to encourage mass adoption

AR ADOPTION BARRIERS AND ATTEMPTS TO OVERCOME

	PRICE	FORM FACTOR / DESIGN	TECHNOLOGY
BARRIER TO MASS ADOPTION	With **prices often exceeding $1,000**, AR headsets are **too expensive** for the average consumer – example prices include: • **Microsoft HoloLens 2**: $3,500 • **Epson Moverio BT-350**: $1,199	Consumers are unlikely to wear **heavy and unattractive headgear** • Many current AR headsets are quite heavy (e.g. Microsoft HoloLens 2 weighs **566g** vs. eyeglasses at an average of **25g to 50g**)	Consumer adoption will require **longer battery life, larger viewing area (FOV), improved visuals, and greater mobility** • Industry specialists **rated user experience (including hardware/ technology) as the top obstacle for mass AR adoption** (32% for AR vs. 19% for VR)
ATTEMPTS TO OVERCOME BARRIER	Several AR companies have **lowered headset prices** to spur growth, often by hundreds of dollars	Companies are pushing to create AR glasses with a profile similar to **eyeglasses or sunglasses** – stylish and lightweight for daily use	Companies are launching headsets with **greater storage** and **larger field of view** to create more immersive AR experiences
COMPANIES WORKING ON BARRIER	• **Kopin SOLOS:** AR glasses for cyclists at $499 • **Nreal Light**: consumer product priced at ~$600 solos nreal	• **Facebook:** partnering with Luxottica to build AR Ray-Bans glasses • **Focals by North smart glasses**[1]**:** similar to stylish prescription glasses, weigh 70g to 80g • **Nreal Light:** weighs 88g facebook NORTH nreal	• **Microsoft HoloLens 2:** larger field of view (FOV)[2] of 52° compared to the original HoloLens with an FOV of 34° • **Vuzix M400:** 64GB storage and 6GB RAM, compared to Vuzix Blade's 8GB storage and 1GB RAM Microsoft VUZIX

EXAMPLE COMPANIES DEVELOPING AR HEADSETS

BIG TECH

AR-FOCUSED

nreal
realwear
EVERYSIGHT
KOPIN
VUZIX
ThirdEye
NORTH[1]
magic leap

Note: Prices as of Oct. 1, 2020.
1. North was acquired by Google in June 2020. 2. Measured as the diagonal field of view in this example.
Sources: Activate analysis, Aniwaa, CB Insights, Company press releases, Company sites, Perkins Coie, Road to VR, Statista, Tom's Hardware, U.S. News & World Report, Wareable

While working to create consumer-friendly AR headsets, companies are exploring transitional technologies to address specific use cases

CURRENT AR HARDWARE IS LIMITED TO NICHE USE CASES

EXAMPLES

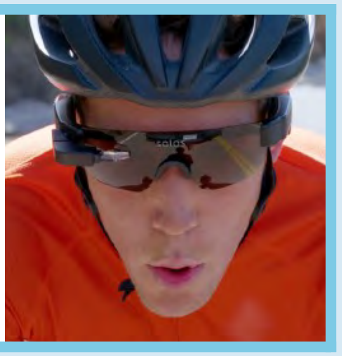
SOLOS AR SMART GLASSES

Use case: Cycling

Price: $499[1]

Description: SOLOS are smart glasses made for cyclists that sync with fitness apps, are compatible with Bluetooth and ANT+, offer navigation, are lightweight (65g), and track workout performance

Limitations: Limited display[2], single use case



SNAP SPECTACLES 3

Use case: Social Media

Price: $380[1]

Description: Spectacles are camera glasses that capture 3D photos and record videos, sync with Snapchat, and can keep up to 100 videos and 1,200 photos

Limitations: No real-time AR effects (added afterward inside the Snapchat app)

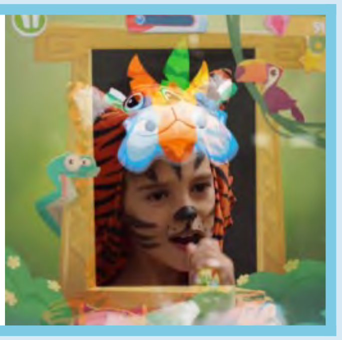
CAREOS - POSEIDON SMART MIRROR

Use case: Health & Beauty

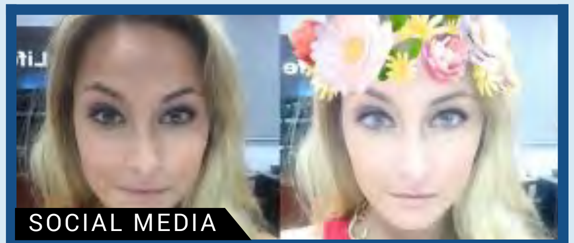
Price: $3,000-$5,000[1]

Description: Poseidon mirrors have the CareOS platform built in with facial recognition, 360° videos, virtual try-ons, skin analysis, vision tests, and voice commands

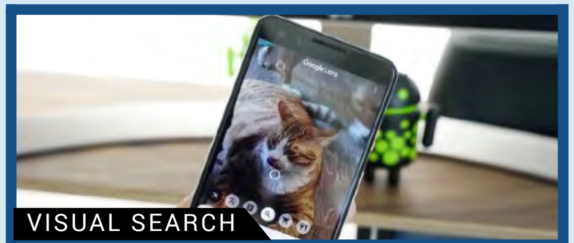
Limitations: Expensive, stationary



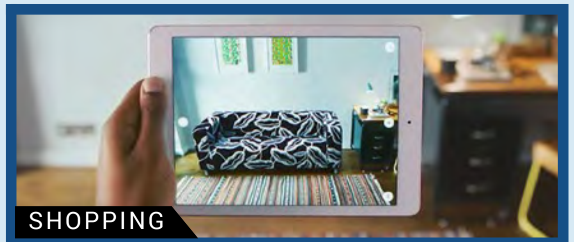
EXAMPLE AUGMENTED REALITY SMARTPHONE APPLICATIONS AND TOOLS



SNAPCHAT LENSES

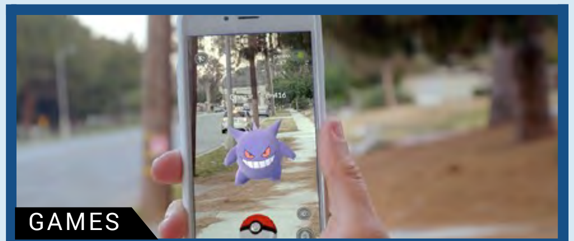


GOOGLE LENS

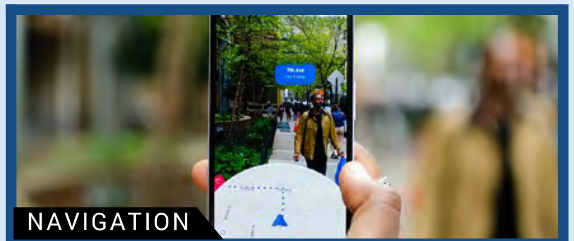


IKEA PLACE

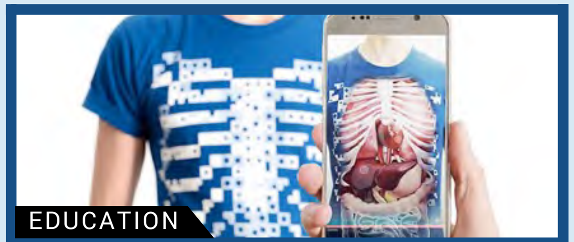
SEPHORA'S VIRTUAL ARTIST



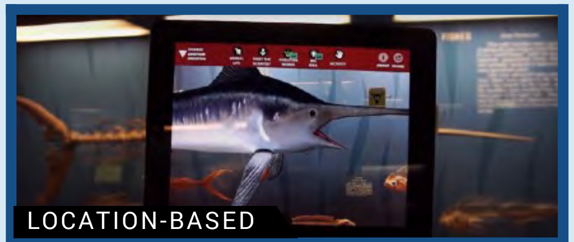
POKÉMON GO



GOOGLE MAPS AR



CURIOSCOPE



SKIN AND BONES (SMITHSONIAN)[3]

activate consulting

1. Prices as of Sept. 21, 2020. 2. Display field of view (FOV) of <11°. 3. Smithsonian National Museum of Natural History.
Sources: Activate analysis, Company press releases, Company sites, Engadget, Wareable

WSJ TECH LIVE

Enterprises are serving as early adopters of AR headsets, due to lower requirements than consumer-grade devices

EXAMPLES OF ENTERPRISE-FOCUSED HEADSETS[1]

MICROSOFT HOLOLENS 2

Price: $3,500

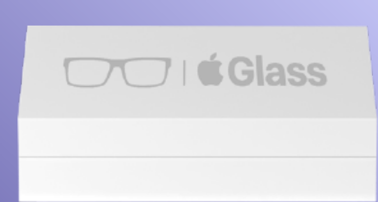
REALWEAR HMT-1

Price: $2,520

GOOGLE GLASS ENTERPRISE EDITION 2

Price: $999

APPLE GLASS



Price: ?

ENTERPRISE AR HEADSET REQUIREMENTS ARE LOWER THAN THOSE FOR CONSUMER DEVICES

- **Cost** is less of a concern for enterprises
- **Comfort is less critical for** work, as most enterprise applications do not require extended wear
- **Style** matters far less in a job setting than for personal use
- **Battery life** can be extended for companies through extra batteries/devices
- **Eye fatigue** is less of a concern at work, as most enterprise applications do not require extended wear vs. habitual consumer use
- **Color accuracy** (e.g. rendering black, chromatic aberrations, etc.) matters less to enterprises

1. Prices as of Sept. 21, 2020.
Sources: Activate analysis, Ars Technica, Company sites

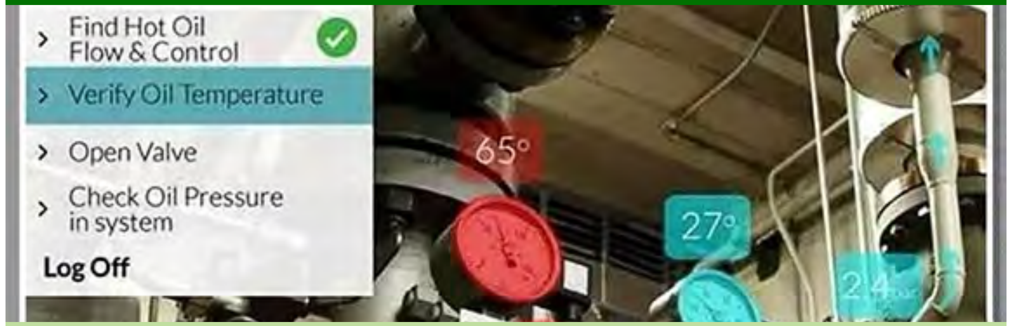
A number of enterprise applications have already emerged for AR headsets that allow users to augment additional information, such as surgical overlays and interactive learning

SELECT AR ENTERPRISE APPLICATIONS

HEALTHCARE

Aid surgeons with precise overlays, give physicians readily viewable patient information, allow paramedics to monitor vitals hands-free, and improve telehealth

MANUFACTURING



Facilitate the installation and maintenance of industrial machinery, and assist engineers with operating and repairing equipment

HIGHER EDUCATION

Allow students to contextualize complex information, dissect virtual cadavers, and visualize 3D mathematical models

JOB TRAINING

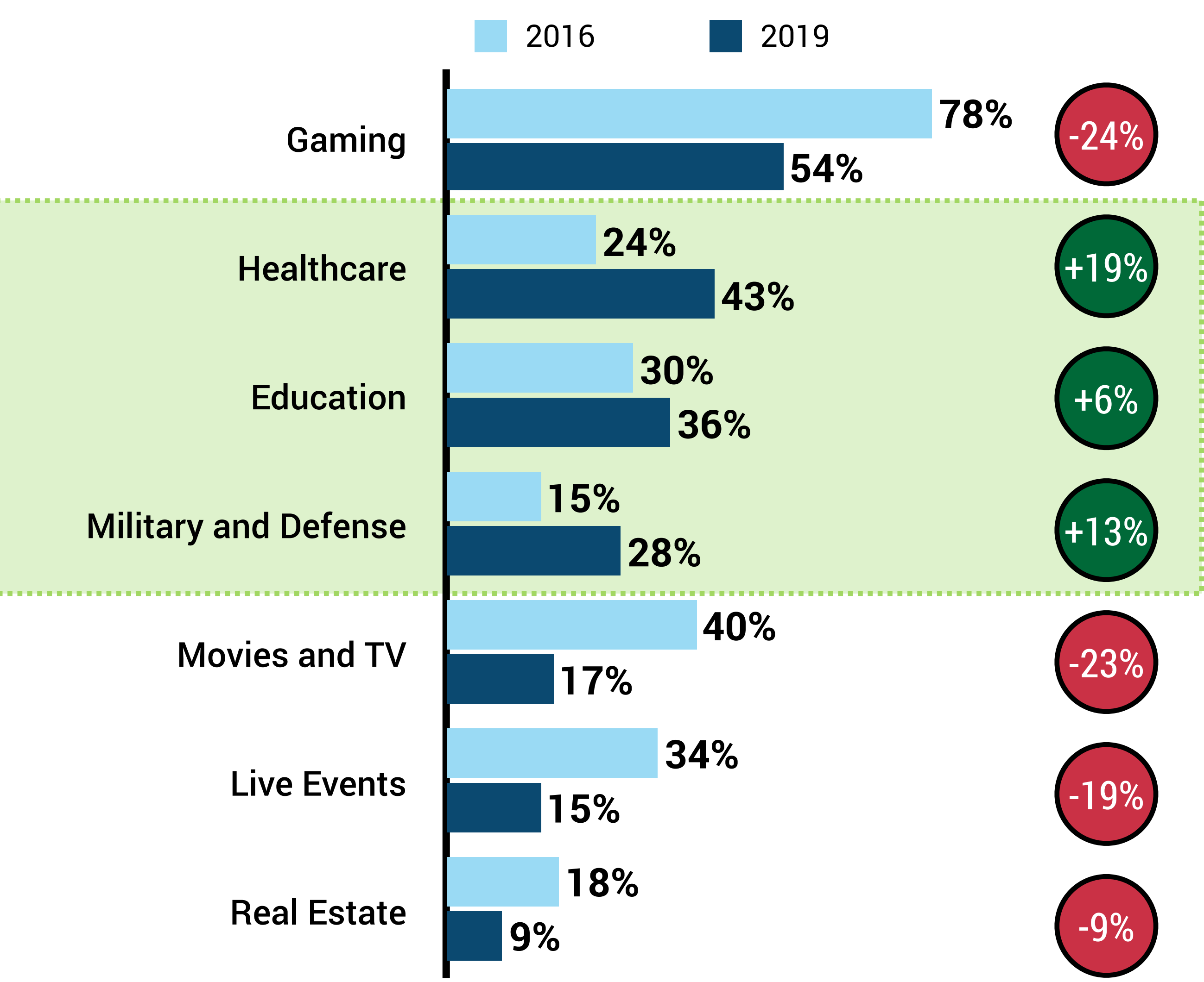
Enable more interactive and safer job training in an easily replicable manner with real-time feedback

Sources: Activate analysis, Ars Technica, Company sites

Expected investment across AR and VR reflects this growing emphasis on enterprise – however, large technology firms still have an eye on the consumer prize

EXPECTED INVESTMENT AREAS FOR AR/VR, GLOBAL, 2016 VS. 2019, % INDUSTRY PROFESSIONALS[1]

Industry professionals increasingly expect investment to shift towards enterprise-focused applications



M&A AND INTERNAL DEVELOPMENTS BY SELECT LARGE TECHNOLOGY COMPANIES

COMPANY	ACQUISITIONS	INTERNAL DEVELOPMENTS	PRIMARY FOCUS
	NEXTVR, Camerai, SPACES., flyby, VRVANA, metaio	Glass (rumored), ARKit	Consumer
	oculus, SCAPE, Dreambit, SANZARU GAMES, CTRL-Labs, Beat Games, READY AT DAWN, Zurich Eye	FACEBOOK Reality Labs, oculus, Oculus headsets (Quest, Rift, Rift S, Go), Spark AR, *AR Glasses announced (e.g. Project Aria, Luxottica partnership)*	Consumer & Enterprise
	NORTH, Owlchemy Labs, phoneticarts, SKILLMAN & HACKETT	Daydream (discontinued), Cardboard, GLASS, ARCore	Consumer & Enterprise
	AltspaceVR	Microsoft HoloLens, Microsoft Mixed Reality	Enterprise
	None publicly stated	Minor developments (e.g. features to virtually preview products)	None Declared

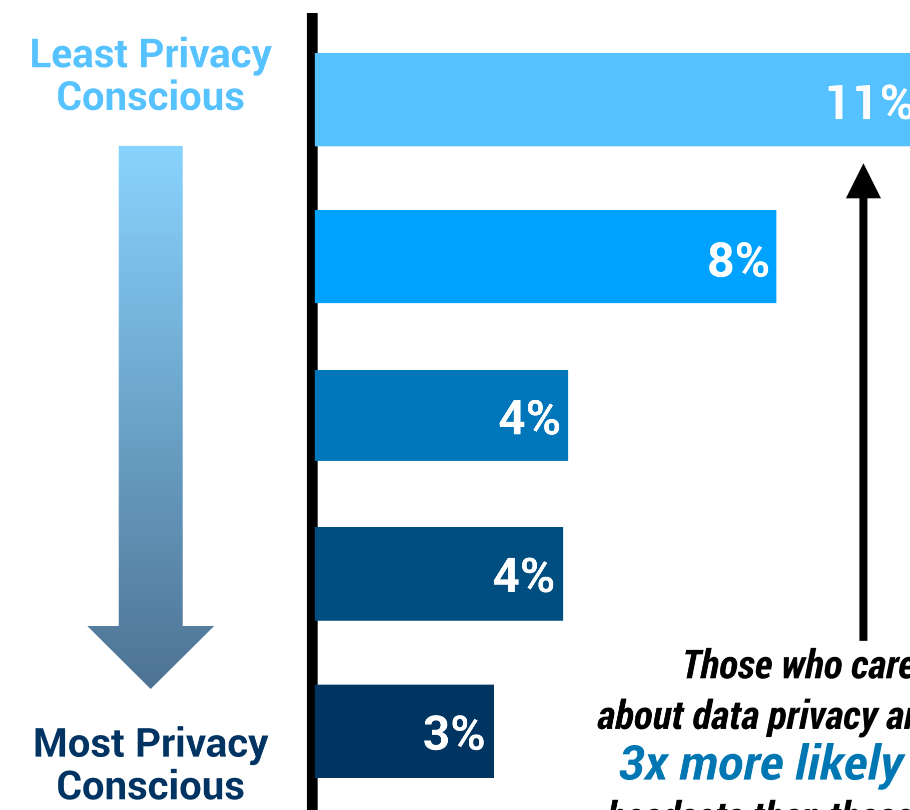
1. Perkins Coie Augmented and Virtual Reality Survey 2016 (n = 653) and 2019 (n = 200). Respondents consisted of industry professionals. "Industry professionals" include industry executives and founders, advisors, policymakers, investors, and other professionals.
Sources: Activate analysis, Company press releases, Company sites, Crunchbase, Perkins Coie

A significant portion of the value of owning consumer AR/VR is around data, especially for AR – companies will need to convince consumers that their privacy will be protected in order to succeed

EXAMPLE DATA TYPES ENABLED BY AUGMENTED REALITY

	DESCRIPTION	VALUE OF DATA	COMPANIES INVOLVED
BIOMETRIC DATA	Data on **facial expressions, body movements, eye tracking** (i.e. what a user is looking at)	**Measures biometric data to leverage for several use cases** • **Build psychographic profiles** for targeted ads • **Track and make health predictions** (e.g. dermatology diagnosis) • **Identify users** with eye-based logins for access control, ID management, and purchases	tobii Ocutrx
VIRTUAL REAL ESTATE	**Digital layer of information/visuals overlaid on top of real-world locations** (analogous to Google Maps in AR)	**Creates a new advertising channel** • Generate higher engagement from interactive local ads • Improve ad attribution • Increase digital ad inventory	mapbox NIANTIC + Google
VISUAL SEARCH DATA	**Information on real-world items,** identified by augmented realty	**Creates a new marketing and shopping channel** • Suggest where to buy items to users and learn users' design preferences • Increase engagement with interactive ads	Google Pinterest amazon

AR HEADSET USAGE[1], U.S., 2020, % ADULTS AGED 18+ BY DEGREE OF DATA PRIVACY CONCERN



Those who care the least about data privacy are roughly ***3x more likely*** *to use AR headsets than those who care the most about data privacy*

Companies selling AR headsets will need to offer data privacy protections to reach the largest audience

1. Includes adults aged 18+ who have used AR headsets for personal use in the last 12 months.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Company press releases, HubSpot, Shopify, World Economic Forum, ZDNet

AR/VR: What will determine the winners?

AUGMENTED REALITY / VIRTUAL REALITY

MATURE TECHNOLOGY

Mature technology that allows for quality visuals, reasonable battery life, and a high degree of mobility

CONTENT ECOSYSTEM

A robust ecosystem with enough content for users and sophisticated developer tools

ATTRACTIVE FORM FACTOR

An attractive form factor that is stylish and light enough to be worn in public (similar to eyeglasses/ sunglasses)

AFFORDABLE PRICE

Affordable price at a level comparable to smartphones or high-end wearables (e.g. smartwatches)

PRIVACY ASSURANCE

Consumer trust in privacy protections (for both wearers and those around them)

Source: Activate analysis

CONTENTS

activate consulting
www.activate.com

The COVID-19 outbreak forced the adoption of new technologies for many users

ADOPTION DURING THE COVID-19 OUTBREAK[1] BY ACTIVITY, U.S., 2020, % ADULTS AGED 18+

TELEMEDICINE

of consumers who use **telemedicine to see a healthcare provider** tried it for the **first time** during the COVID-19 outbreak[1]…

…bringing the total share of users to

41%

VIDEO CONFERENCING FOR PROFESSIONAL PURPOSES

of consumers who use **video conferencing for professional purposes** tried it for the **first time** during the COVID-19 outbreak[1]…

…bringing the total share of users to

41%

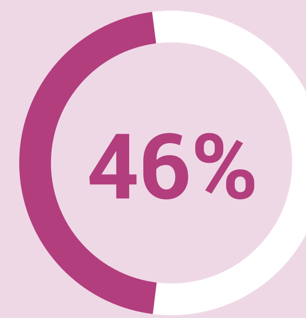
CHAT SERVICES FOR PROFESSIONAL PURPOSES

of consumers who use a **chat service for professional purposes** (e.g. Slack) tried it for the **first time** during the COVID-19 outbreak[1]…

…bringing the total share of users to

27%

VIDEO CONFERENCING FOR SOCIAL PURPOSES

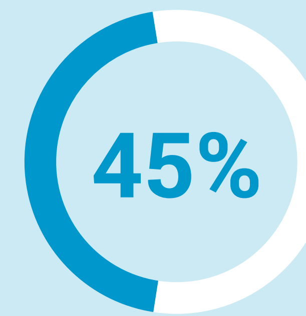


of consumers who use **video conferencing for social purposes** tried it for the **first time** during the COVID-19 outbreak[1]…

…bringing the total share of users to

54%

FITNESS VIDEO STREAMING



of consumers who use **fitness video streaming** (e.g. Peloton classes, YouTube yoga videos) tried it for the **first time** during the COVID-19 outbreak[1]…

…bringing the total share of users to

22%

1. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Connectivity & Video Research Study (n = 2,123)

Activate forecasts that video will drive 90% of household data usage growth over the next 5 years, with household data usage nearing 1 Terabyte per month by 2024

DATA USAGE INCREASE[1], U.S., 2015-2019 VS. 2019-2024E, CHANGE IN GB PER HOUSEHOLD PER MONTH

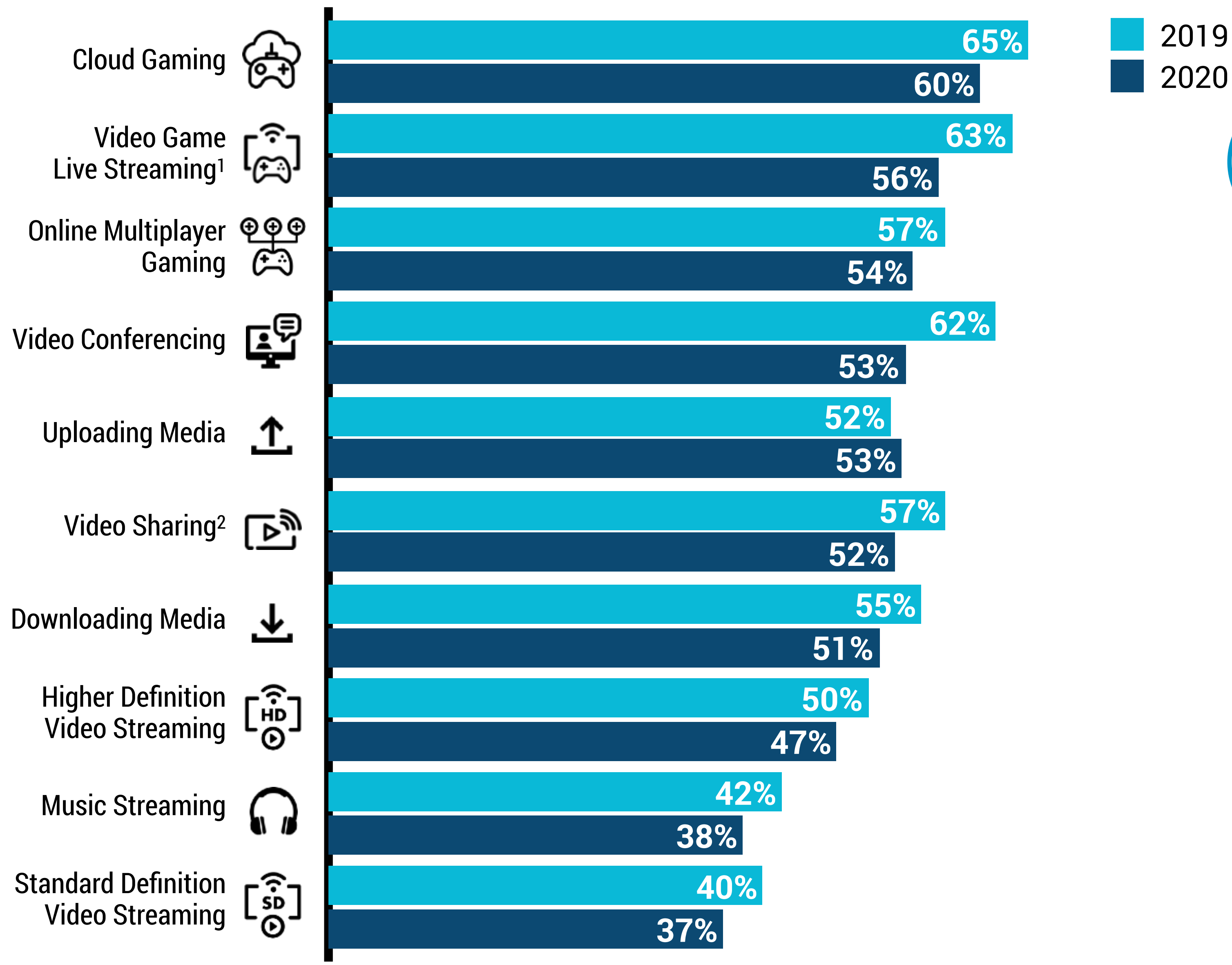
ACTIVATE FORECAST

	2015—2019		2019—2024E		
	HOUSEHOLD DATA USAGE INCREASED FROM 190GB PER MONTH TO 475GB PER MONTH		HOUSEHOLD DATA USAGE WILL CONTINUE TO INCREASE TO 1,000GB PER MONTH		
	USAGE INCREASE	GROWTH	USAGE INCREASE	GROWTH	
Video[2]	250	1.5x	472	1.2x	*Drives ~90% of consumer data use growth*
Communications	18	1.5x	26	0.9x	*Increasingly data intensive, but not as much as video*
Gaming	3	27.0x	15	4.3x	*Fastest driver of growth*
Other[3]	13	0.8x	8	0.3x	

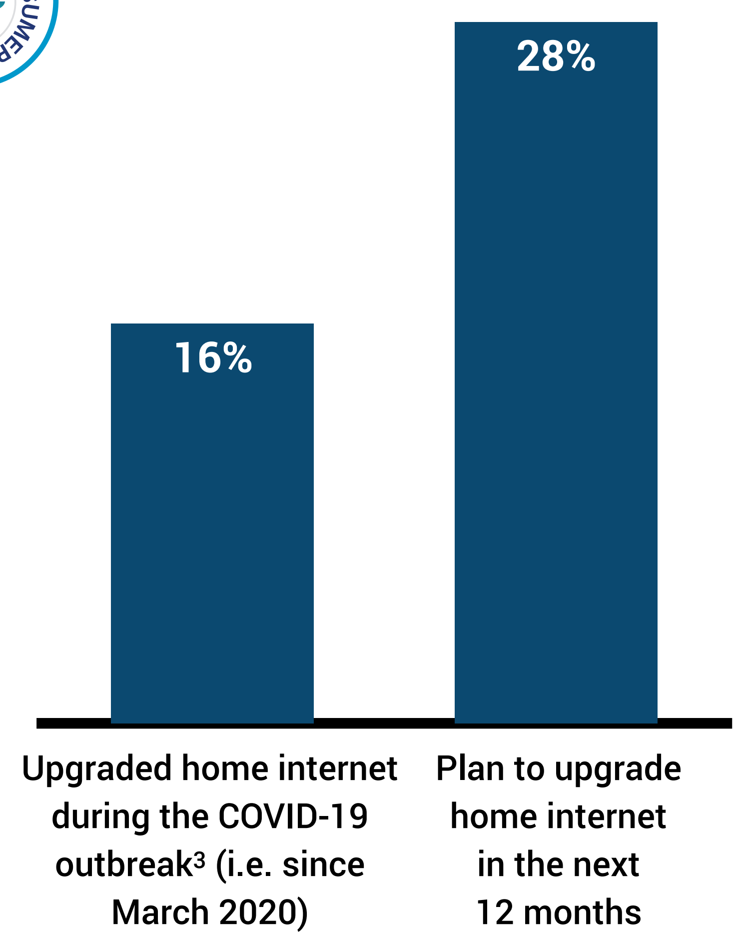
1. "Data usage" includes both mobile and home internet. Figures do not sum due to rounding. 2. "Video" includes online streaming (e.g. Netflix, Amazon Prime) as well as video conferencing (e.g. Zoom, Tele-Education). 3. "Other" includes music, social networking, web browsing, and other digital content.
Sources: Activate analysis, Comscore, DecisionData, Omdia, Pew Research, PricewaterhouseCoopers

Consumers indicate that connectivity continues to be a limitation despite efforts to increase speeds during the COVID-19 outbreak

CONNECTIVITY AS A REPORTED LIMITATION BY ACTIVITY,
U.S., 2019 VS. 2020, % ADULTS AGED 18+ WHO PARTICIPATE IN EACH ACTIVITY



HOME INTERNET UPGRADE BEHAVIOR, U.S., 2020, % ADULTS AGED 18+ WITH HOME INTERNET



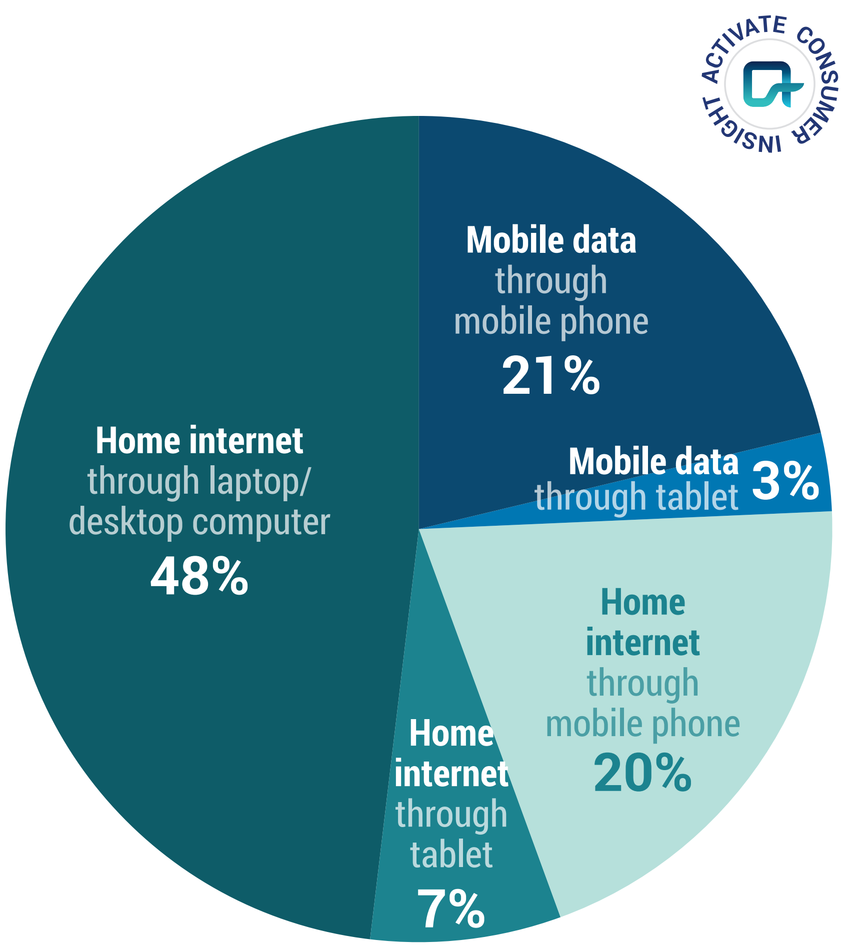
1. Includes recording and broadcasting a live video stream of gaming content via YouTube, Twitch, Mixer, etc. 2. This does not include video game live streaming (e.g. Facebook/Instagram Live, Periscope). 3. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020).
Sources: Activate analysis, Activate 2019 Consumer Tech & Media Research Study (n = 4,006), Activate 2020 Consumer Connectivity & Video Research Study (n = 2,123)

activate consulting

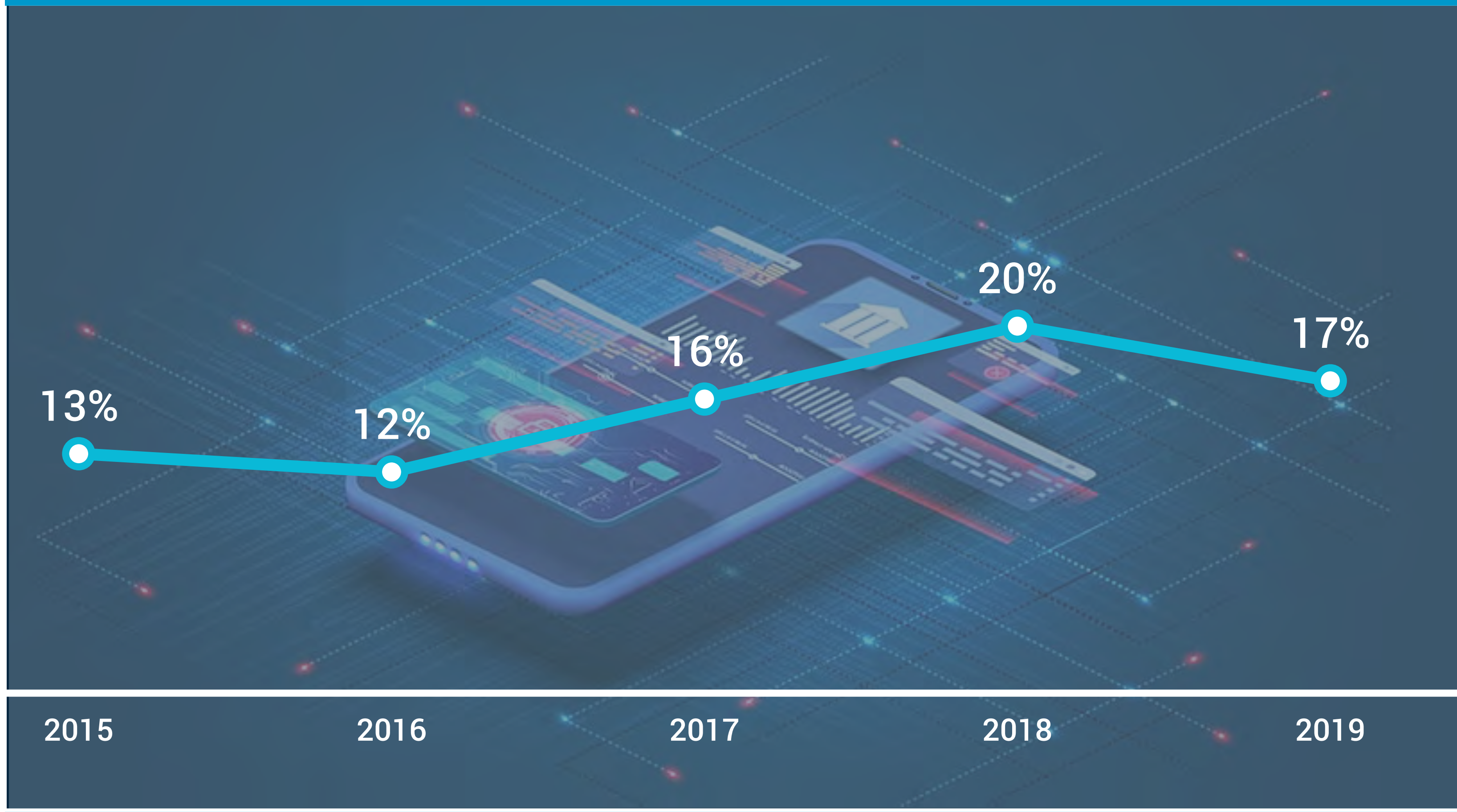
WSJ TECH LIVE

Today, fixed-line broadband remains the primary method for consumer internet connection

PRIMARY METHOD OF CONNECTING TO THE INTERNET AT HOME BASED ON TIME SPENT[1], U.S., 2020, % ADULTS AGED 18+ WITH A HOME INTERNET AND/ OR MOBILE DATA PLAN



CONSUMERS WITH A SMARTPHONE AND NO FIXED BROADBAND,
U.S., 2015-2019, % ADULTS AGED 18+

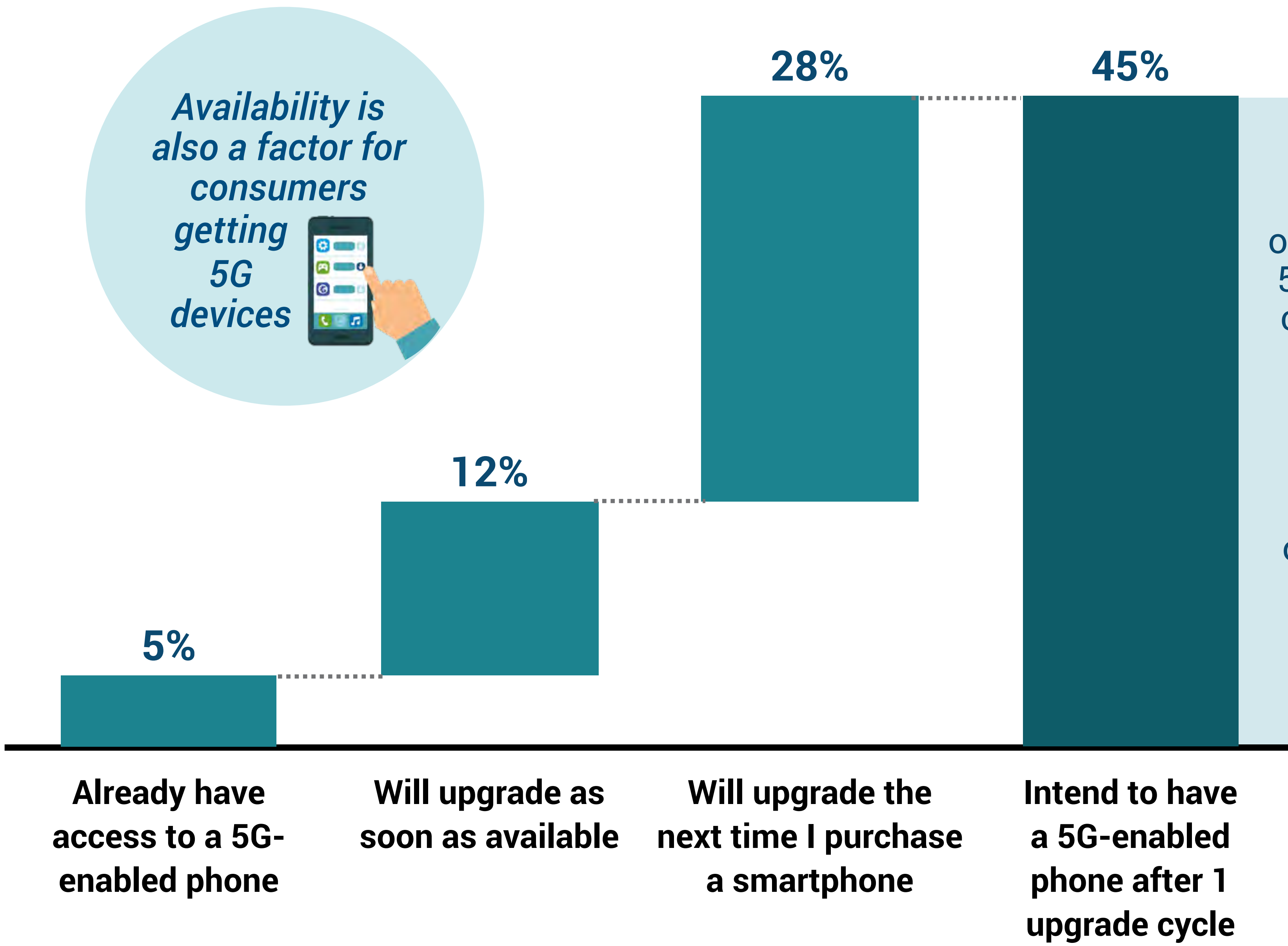


While the FCC estimates only **21 million** U.S. consumers lack broadband access, Microsoft and Pew Research estimate that up to **160 million** U.S. consumers are not using internet with broadband level speeds

1. Figures do not sum to 100% due to rounding.
Sources: Activate analysis, Activate 2020 Consumer Connectivity & Video Research Study (n = 2,123), Federal Communications Commission, Microsoft, Pew Research

Activate research indicates that there will be quick adoption of 5G mobile devices, with 45% of consumers intending to have a 5G-enabled phone within an upgrade cycle

5G UPGRADE INTENT, U.S., 2020, % ADULTS AGED 18+



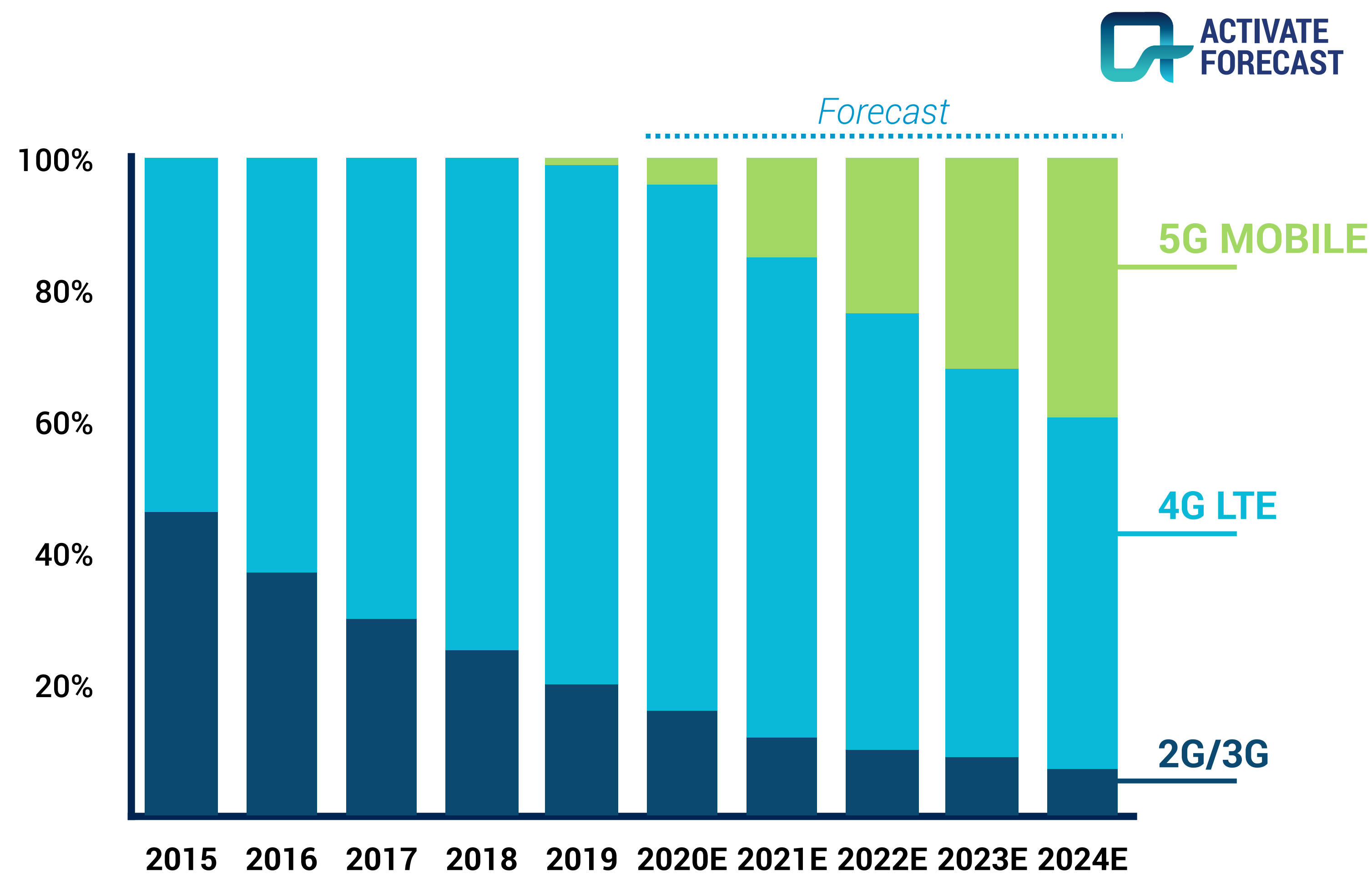
17%
of consumers who intend to have a 5G-enabled phone after 1 upgrade cycle are **willing to pay more for a 5G-enabled smartphone**

12%
of consumers who intend to have a 5G-enabled phone after 1 upgrade cycle are **willing to pay more for a data plan with 5G**

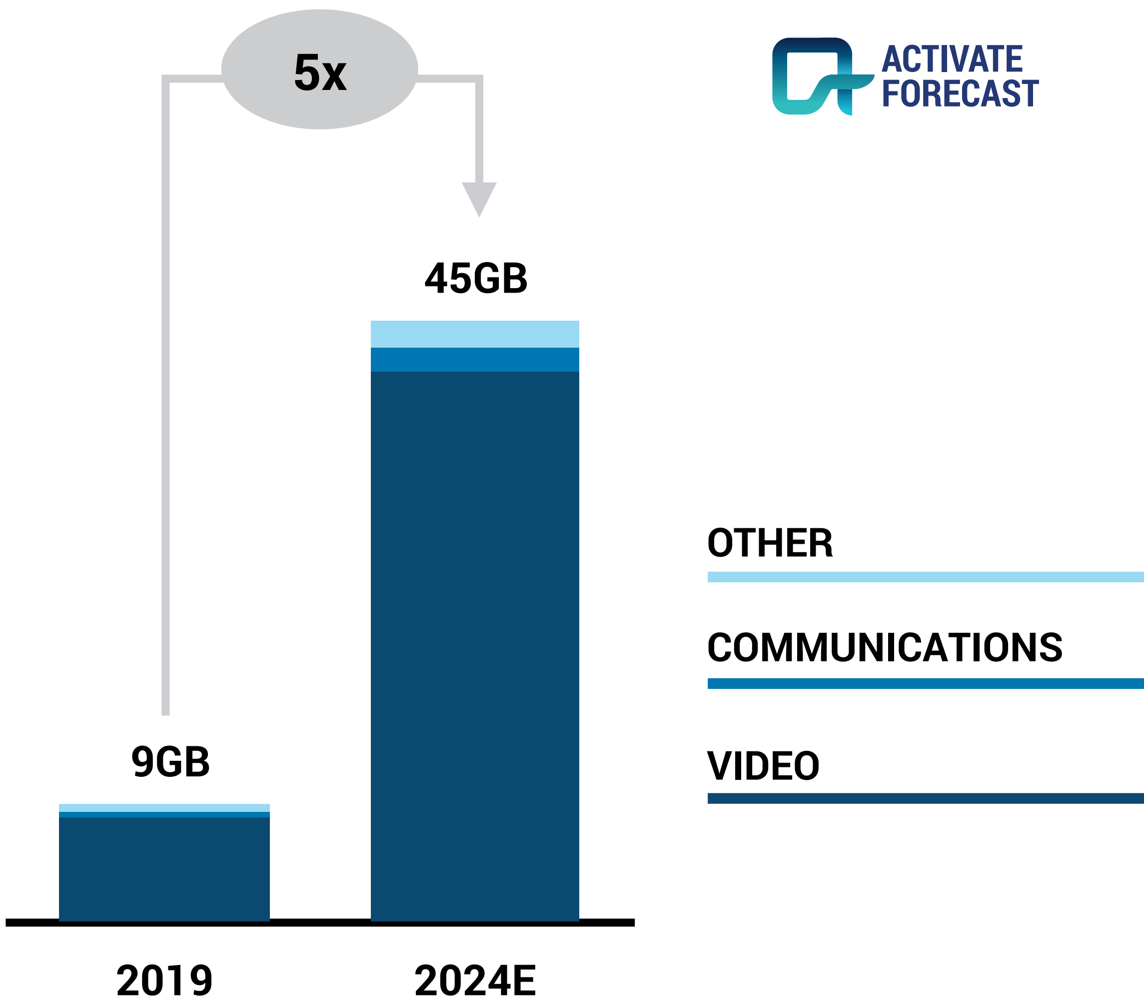
Sources: Activate analysis, Activate 2020 Consumer Connectivity & Video Research Study (n = 2,123)

By 2024, roughly 40% of U.S. consumers will use 5G, and mobile data demand will continue to rise; 5G's potential will far outstrip consumer demand alone

CONSUMER ADOPTION OF CONNECTIVITY STANDARDS,
U.S., 2015-2024E, % CONSUMERS WITH A MOBILE DATA PLAN



DATA USAGE PER MOBILE SUBSCRIBER,
U.S., 2019 VS. 2024E, GB PER MONTH



5G can support **10x-100x faster download speeds** and **99.5% lower latency** — existing consumer use cases will not require nearly this much speed and capacity

activate consulting

Sources: Activate analysis, Activate 2020 Consumer Connectivity & Video Research Study (n = 2,123), Comscore, Consumer Technology Association, Counterpoint Research, eMarketer, Ericsson, GSM Association, Omdia, PricewaterhouseCoopers, Statista, U.S. Census Bureau

WSJ TECH LIVE

5G will have a great deal more capacity than required for consumer applications, enabling an entirely new set of applications and innovations in IoT, wireless broadband, smart infrastructure, self-driving cars, and autonomous robotics

Enterprise Wireless Broadband

Virtual Reality Video Conferencing
Autonomous Manufacturing
Autonomous Robots
IoT Monitoring Applications

Transport & Robotics

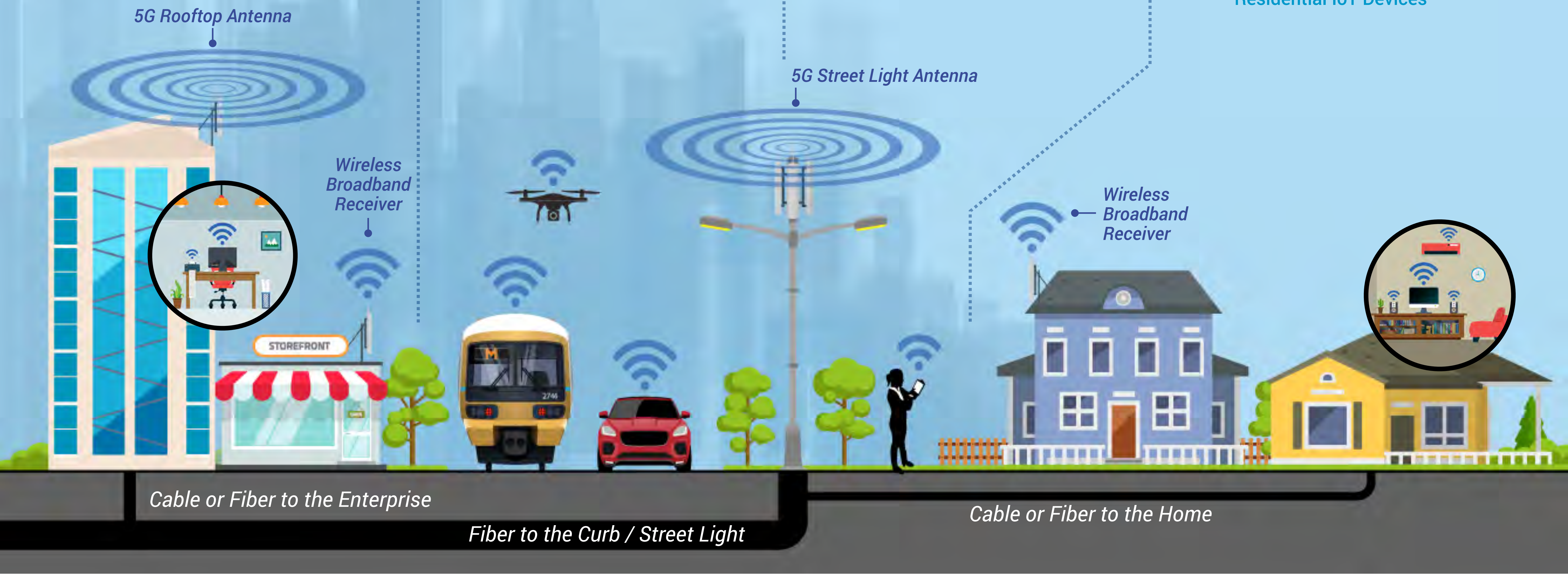
Self-Driving Cars
Autonomous Public Transport
Autonomous Drones

Mobile 5G

HD/4K/6K Video Streaming
Video Conferencing
Mobile & Cloud Gaming
Augmented Reality / Virtual Reality

Consumer Wireless Broadband

HD/4K/6K Video Streaming
Video Conferencing
Online & Cloud Gaming
Augmented Reality / Virtual Reality
Residential IoT Devices



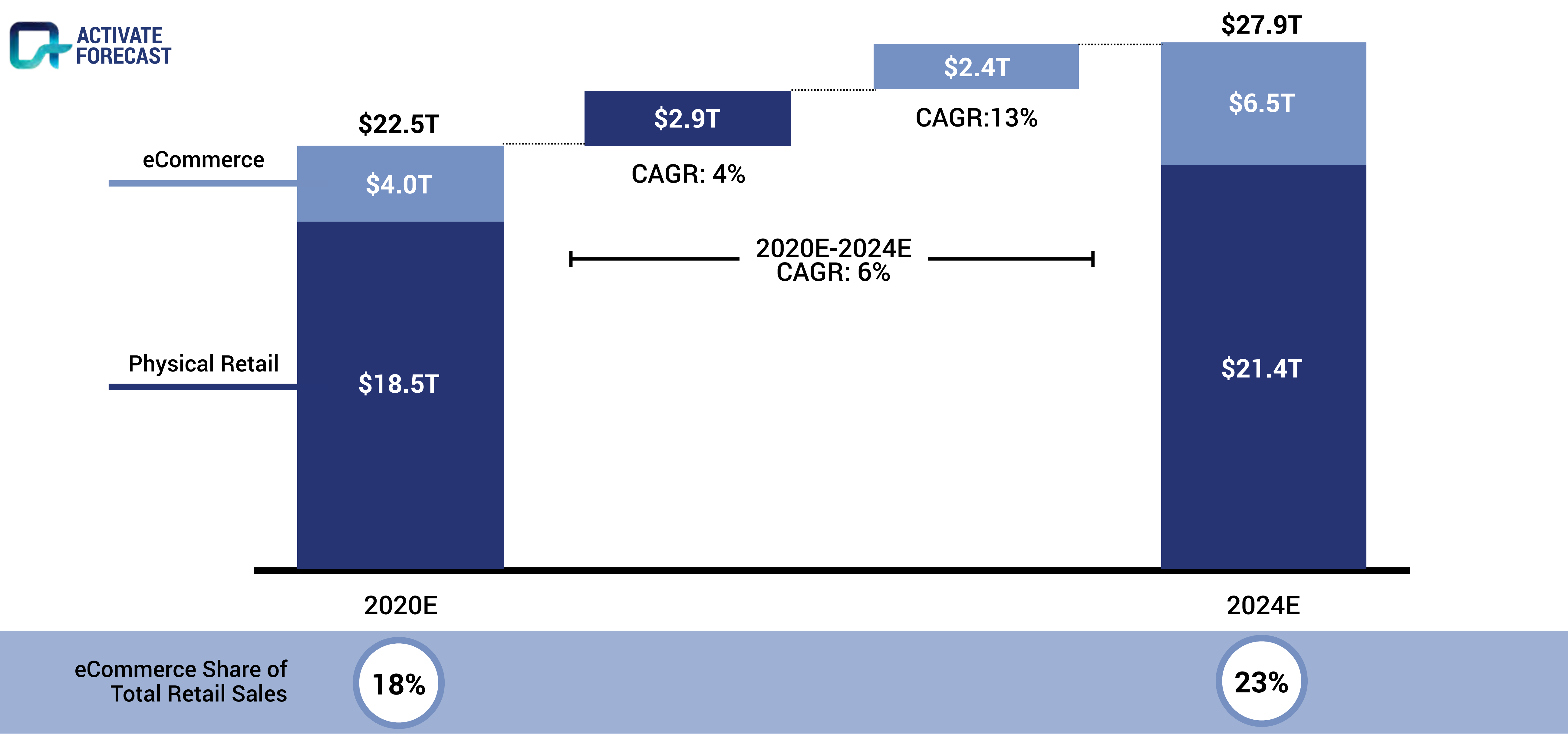
Sources: Activate analysis, Company sites

CONTENTS

activate consulting
www.activate.com

Global eCommerce will reach $6.5T in 2024, growing by over 13% CAGR; nevertheless, physical retail will continue to grow (recovering from a severe decline in 2020)

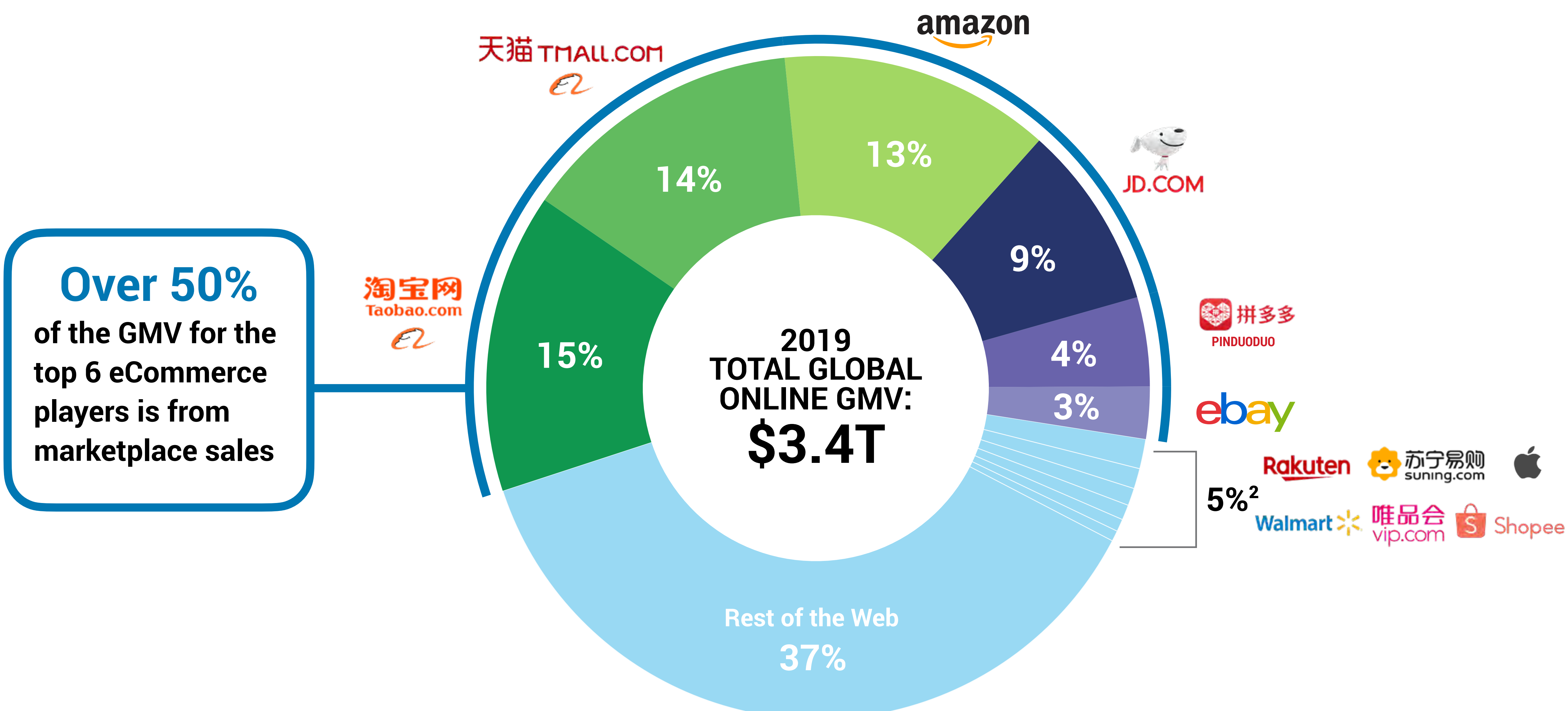
RETAIL SALES BY CHANNEL[1], GLOBAL, 2020E VS. 2024E, TRILLIONS USD



1. Figures do not sum due to rounding. Excludes travel and tickets and other services (e.g. food service and gambling).
Sources: Activate analysis, eMarketer, Forrester, National Retail Federation, Research and Markets, U.S. Census Bureau, U.S. Department of Commerce

Two thirds of the global eCommerce transaction volume is concentrated within the top 6 players; most importantly, these are largely marketplaces vs. online retailers

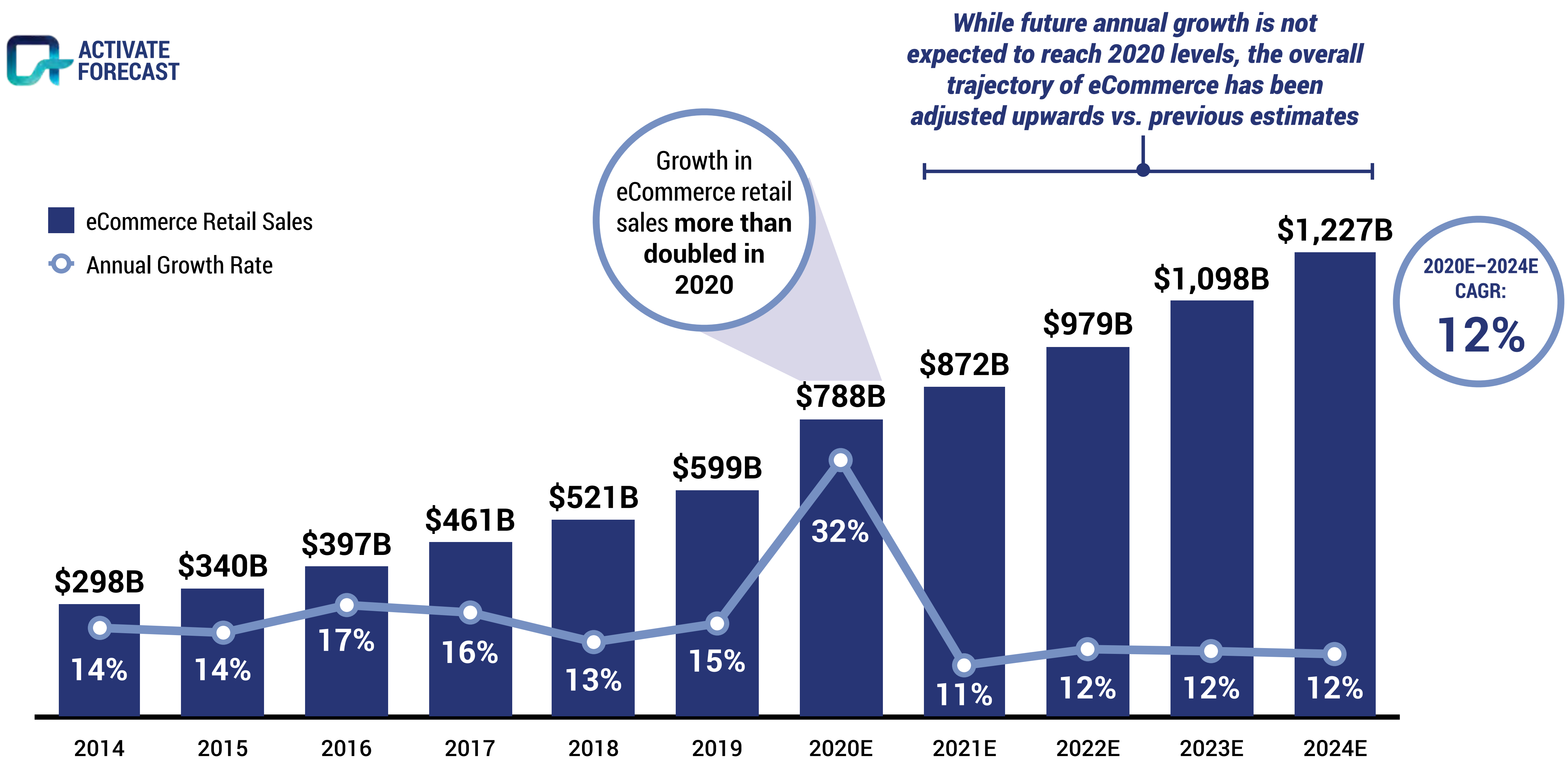
ONLINE GROSS MERCHANDISE VOLUME (GMV)[1], GLOBAL, 2019, % TOTAL GMV



1. Excludes the combination of individual merchants using eCommerce enablement platforms (e.g. Shopify).
2. Each company accounts for between 0.5% and 2% of the total GMV.
Sources: Activate analysis, Company filings, Company press releases, Company sites, Digital Commerce 360, eMarketer

The COVID-19 outbreak has dramatically accelerated the trajectory of eCommerce in the U.S., with the growth rate reaching 32% in 2020; this will be sustained at around 12% in the coming years

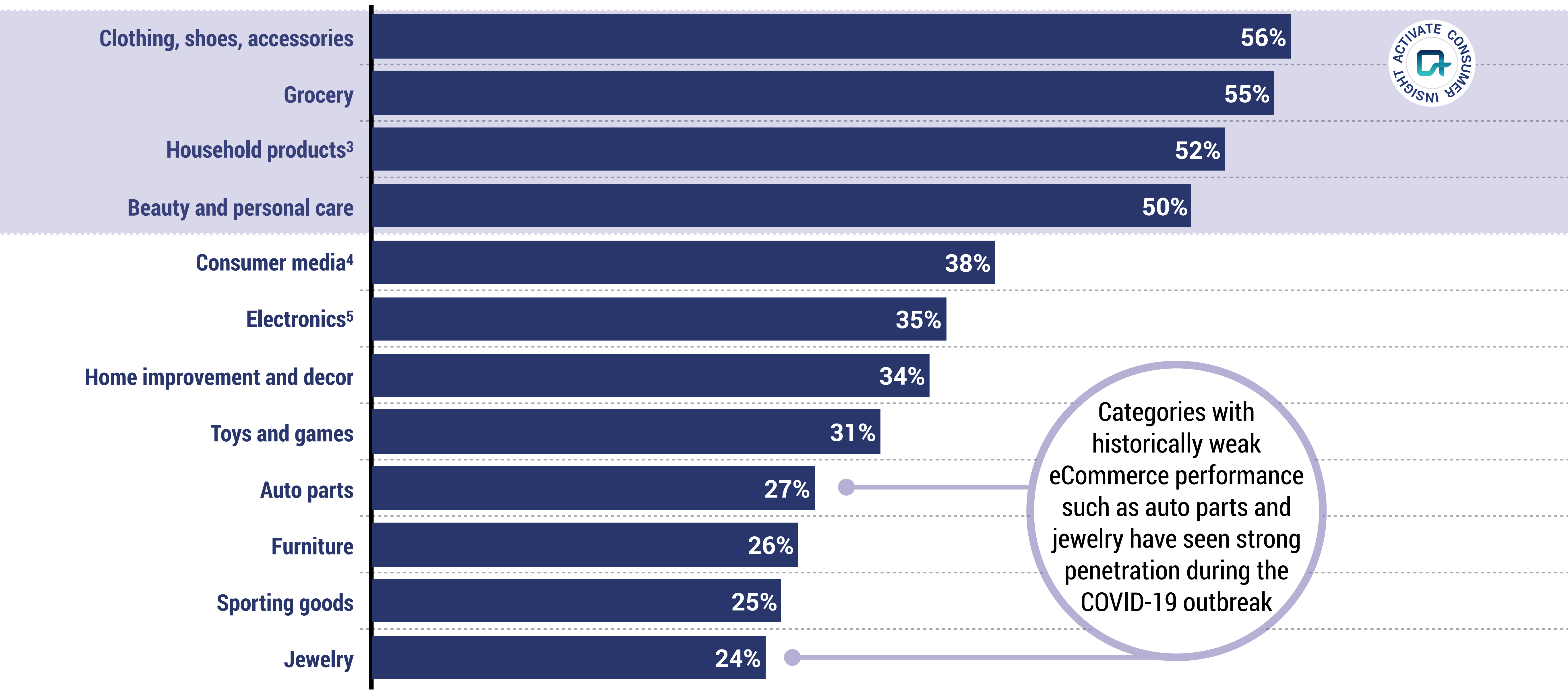
TOTAL ECOMMERCE RETAIL SALES AND ANNUAL GROWTH[1], U.S., 2014-2024E, BILLIONS USD / % ANNUAL GROWTH



1. Excludes travel and tickets and other services (e.g. food service and gambling).
Sources: Activate analysis, eMarketer, Forrester, National Retail Federation, Research and Markets, U.S. Census Bureau, U.S. Department of Commerce

Strong U.S. eCommerce growth is supported by high levels of penetration across product categories, led by clothing, grocery, household products, and beauty / personal care

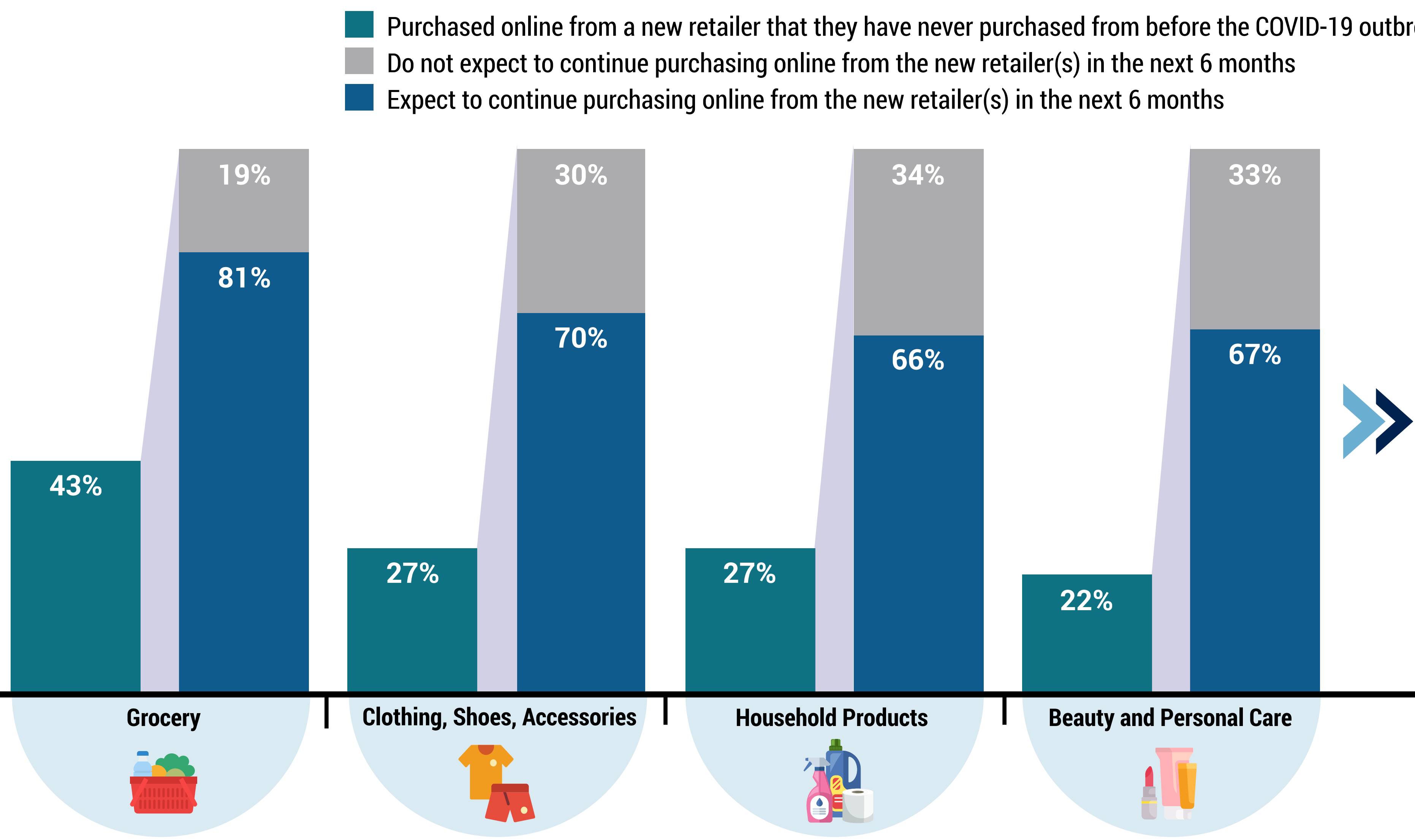
ECOMMERCE PENETRATION[1] DURING THE COVID-19 OUTBREAK[2] BY PRODUCT CATEGORY, U.S., 2020, % ADULTS AGED 18+



1. "Penetration" is defined as those who indicated that at least 10% of their purchases in the category were online. 2. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). 3. "Household products" include cleaning supplies and paper towels. 4. "Consumer media" includes CDs, books, DVDs, and video games. 5. "Electronics" include mobile phones and gaming consoles.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

During the COVID-19 outbreak, many customers purchased from eCommerce retailers that they had not purchased from before – most indicate that they are likely to continue shopping at these new retailers

CONSUMER ONLINE PURCHASING BEHAVIOR FROM NEW RETAILERS[1] DURING THE COVID-19 OUTBREAK[2], U.S., 2020, %
ECOMMERCE PURCHASERS[3] BY PRODUCT CATEGORY / % ECOMMERCE PURCHASERS FROM NEW RETAILERS BY PRODUCT CATEGORY

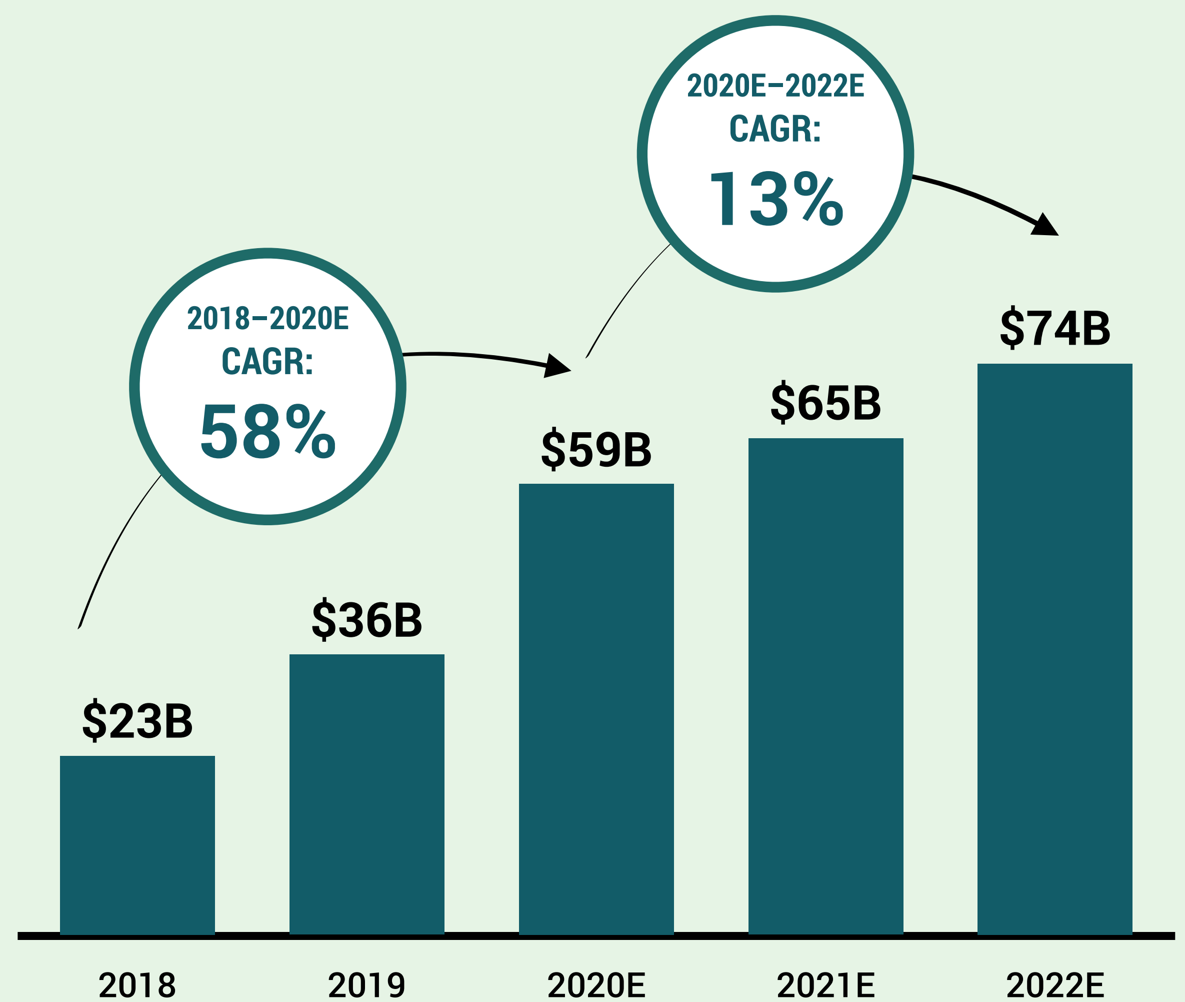


ACROSS PRODUCT CATEGORIES, THOSE THAT PURCHASED ONLINE FROM A RETAILER THAT THEY HAD NOT PURCHASED FROM BEFORE THE COVID-19 OUTBREAK ARE LIKELY TO CONTINUE PURCHASING FROM THAT RETAILER

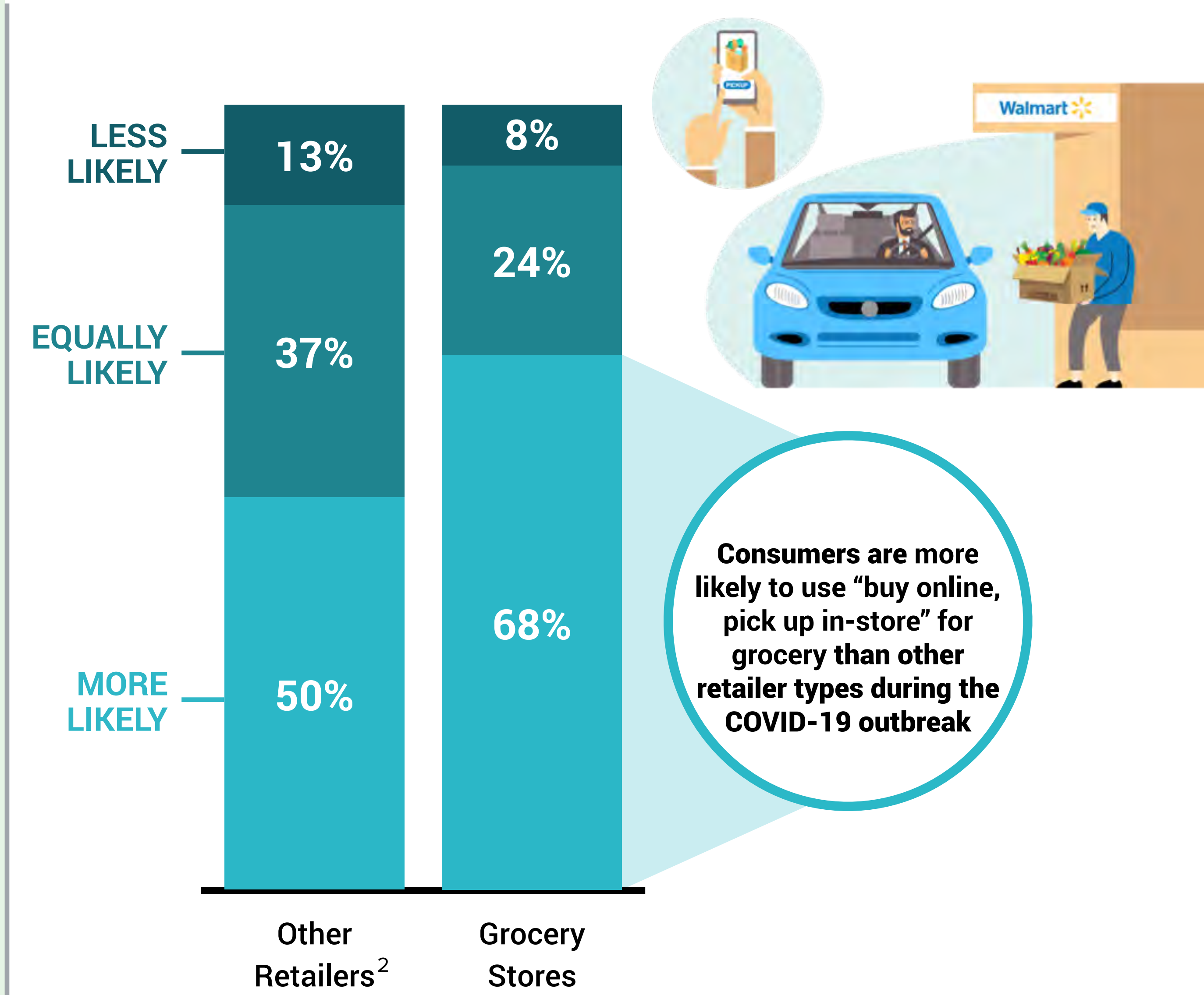
1. "New retailers" refer to retailers that the consumer had never purchased from before the COVID-19 outbreak. 2. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). 3. "eCommerce purchasers" refer to adults aged 18+ who have purchased at least one item in the product category online during the COVID-19 outbreak. 4. "Before the COVID-19 outbreak" refers to the period before the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. before Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Following the COVID-19 outbreak, buy online, pick up in-store will be important to sustain eCommerce growth, especially in grocery

TOTAL "BUY ONLINE, PICK UP IN-STORE" SALES,
U.S., 2018-2022E, BILLIONS USD



LIKELIHOOD OF USING "BUY ONLINE, PICK UP IN-STORE" DURING THE COVID-19 OUTBREAK[1],
U.S., JUNE 2020, % ADULTS AGED 16+

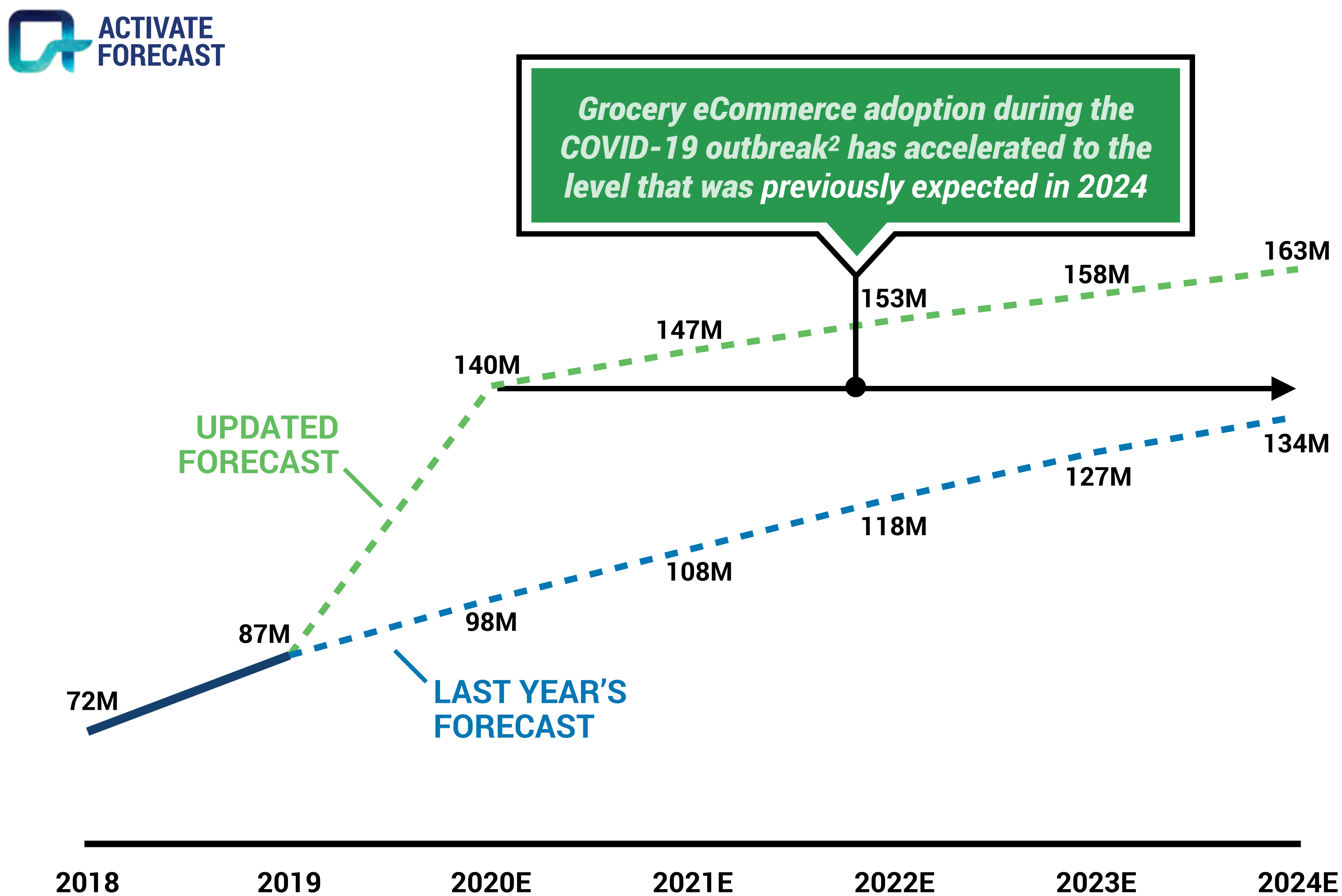


activate consulting

1. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). 2. "Other retailers" do not include pharmacies.
Sources: Activate analysis, eMarketer, Qudini

Grocery was one of the primary beneficiaries of accelerated eCommerce growth – in 2020, the number of online grocery purchasers reached the level previously not expected until 2024

ONLINE GROCERY PURCHASERS[1], U.S., 2018-2024E, MILLIONS PURCHASERS AGED 18+



DRIVERS OF CONTINUED GROCERY ECOMMERCE GROWTH

1. Buy online, pick up in-store offering
2. Speedier delivery
3. Commitment to quality produce

1. "Online grocery purchasers" refer to consumers who have made at least one grocery order online, including "buy online, pick up in-store." 2. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), eMarketer, U.S. Census Bureau

Platforms such as Shopify are enabling eCommerce growth by making it easier for companies to sell online

EXAMPLE PLATFORMS

shopify

Magento An Adobe Company

BIGCOMMERCE

PROVIDE MERCHANTS WITH CAPABILITIES AND RESOURCES ACROSS THE ECOMMERCE STACK, INCLUDING:

STORE CREATION

- eCommerce website creation, including free and paid website themes
- Website hosting (provided by Shopify and BigCommerce)
- Ability to plug into additional channels:

facebook ebay amazon Walmart Marketplace

ANALYTICS

Access to customer data (e.g. acquisition, spend, search, cart abandonment) and financial performance metrics

MARKETING

Built-in tools and apps to assist with marketing campaigns

POINT OF SALE

Point of sale mobile apps and hardware integration (e.g. barcode scanners)

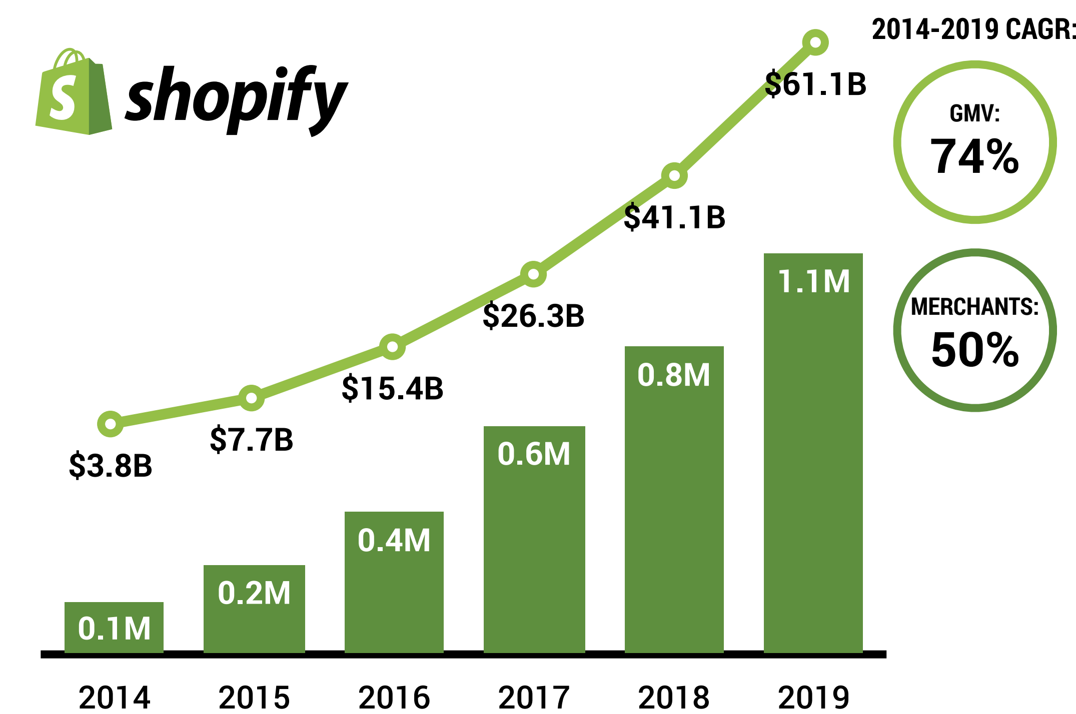
PAYMENTS

Ability to connect with first-party and/or third-party payment gateways (e.g. Shopify Payments, PayPal)

FULFILLMENT

- Capability to integrate drop shipping fulfillment
- Connection to ShipBob, Shipwire, ShipStation, and other fulfillment partners

SHOPIFY GROSS MERCHANDISE VOLUME (GMV) AND NUMBER OF MERCHANTS USING THE SHOPIFY PLATFORM, GLOBAL, 2014-2019, BILLIONS USD / MILLIONS MERCHANTS



EXAMPLE PARTNERSHIP

Walmart Marketplace × shopify

June 2020: The partnership between Walmart Marketplace and Shopify expands the reach of Shopify sellers to Walmart's 120M monthly website visitors and enables Walmart Marketplace to bring on additional sellers (~1,200 by the end of 2020)

Sources: Activate analysis, Company filings, Company sites, Digiday, TechCrunch

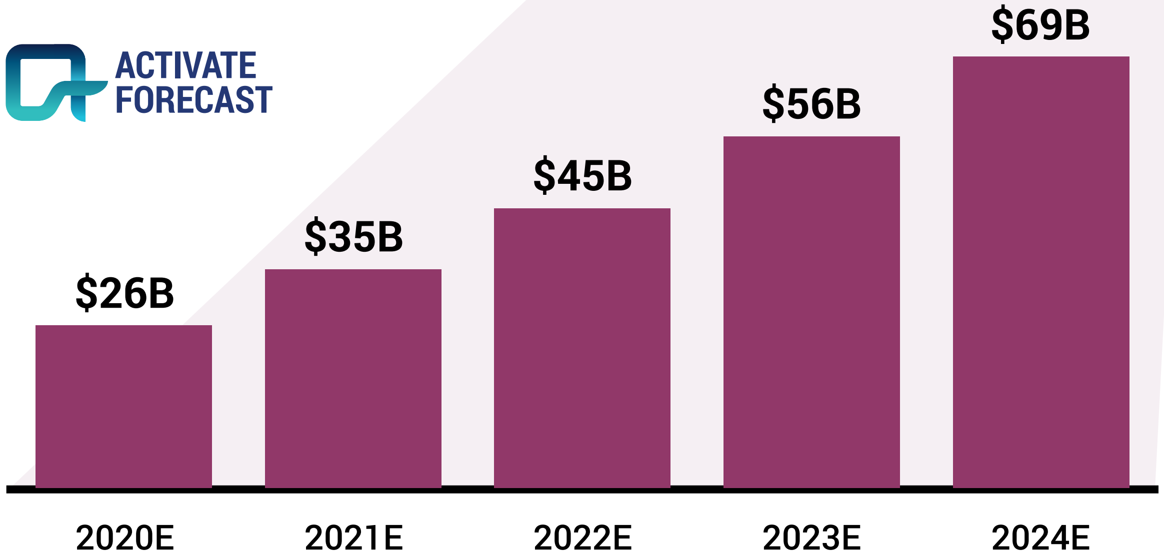
Growth in social commerce will outpace that of both mobile and total eCommerce – content and commerce will converge

EXPECTED GROWTH RATES OF RETAIL ECOMMERCE[1] BY SEGMENT, U.S., 2020E-2024E, % CAGR

12%	16%	27%
Total eCommerce CAGR 2020E-2024E	Mobile Commerce[2] CAGR 2020E-2024E	Social Commerce[3] CAGR 2020E-2024E

SOCIAL COMMERCE REVENUE, U.S., 2020E-2024E, BILLIONS USD

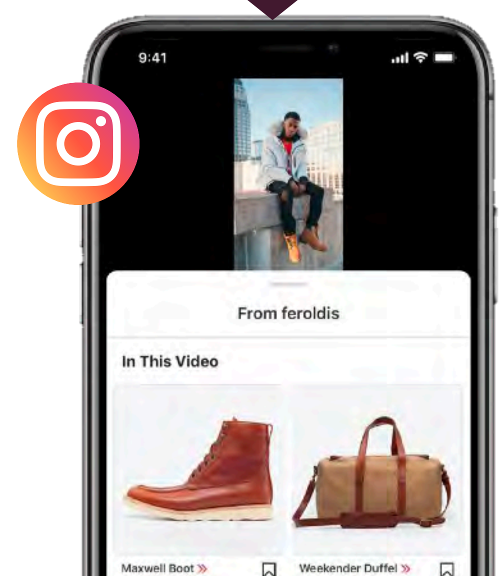
ACTIVATE FORECAST



COMMERCE FEATURES LAUNCHED BY MAJOR SOCIAL NETWORKS IN 2020

INSTAGRAM "IGTV" SHOPPING

Launched features for users to shop through IGTV videos – planning to test shopping on Reels later this year

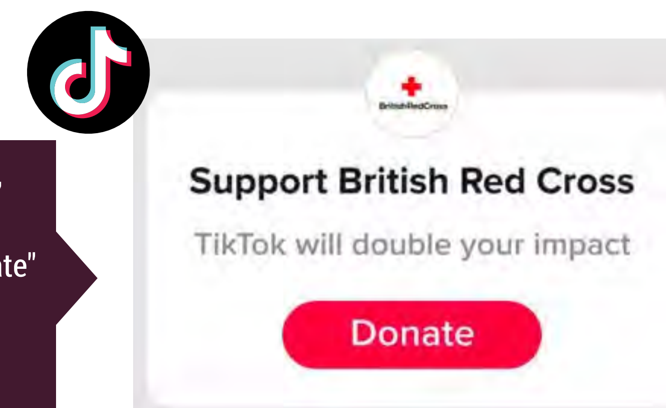


SHOPPABLE SNAPCHAT AR

Launched a test with Gucci to allow users to see what shoes would look like through a Snapchat lens and shop directly from the app

TIKTOK "Donation stickers"

- Built a feature for creators to add a "Donate" button to their videos and live streams
- Opens the door for future monetization opportunities, including shopping



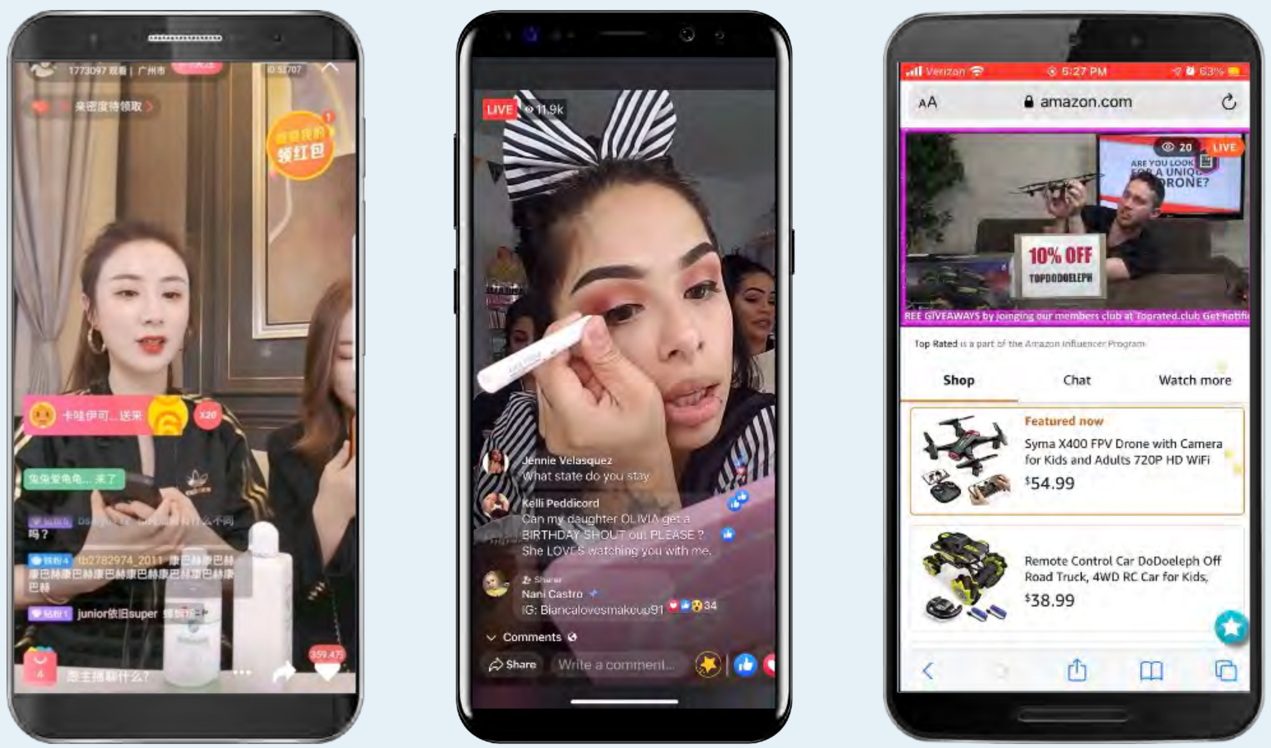
1. Excludes travel and tickets and other services (e.g. food service and gambling). 2. "Mobile Commerce" refers to products purchased via mobile devices (e.g. smartphone, tablet). 3. "Social Commerce" refers to products purchased via social networks regardless of the method of payment or fulfillment; excludes travel and event tickets.
Sources: Activate analysis, Business Insider, Coresight Research, eMarketer, Forrester, National Retail Federation, Research and Markets, Social Media Today, TechCrunch, Technavio, U.S. Census Bureau, U.S. Department of Commerce, The Verge

Livestream shopping, a new form of social commerce, will explode; emerging players will innovate alongside established players such as Amazon and Facebook

EXAMPLES OF LIVESTREAM SHOPPING

LIVESTREAM SHOPPING ENABLES BUYERS AND SELLERS TO HAVE A MORE ENGAGING EXPERIENCE

淘宝网 Taobao.com | facebook | amazon



SELECT LIVESTREAM SHOPPING PLAYERS

LARGE TECH PLAYERS

- 淘宝网 Taobao.com
- facebook
- amazon

EMERGING PLAYERS

- NTWRK
- COMMENT Sold
- talkshoplive
- POPSHOPLIVE

Sources: Activate analysis, Bloomberg, BloombergQuint, Company sites, TechCrunch

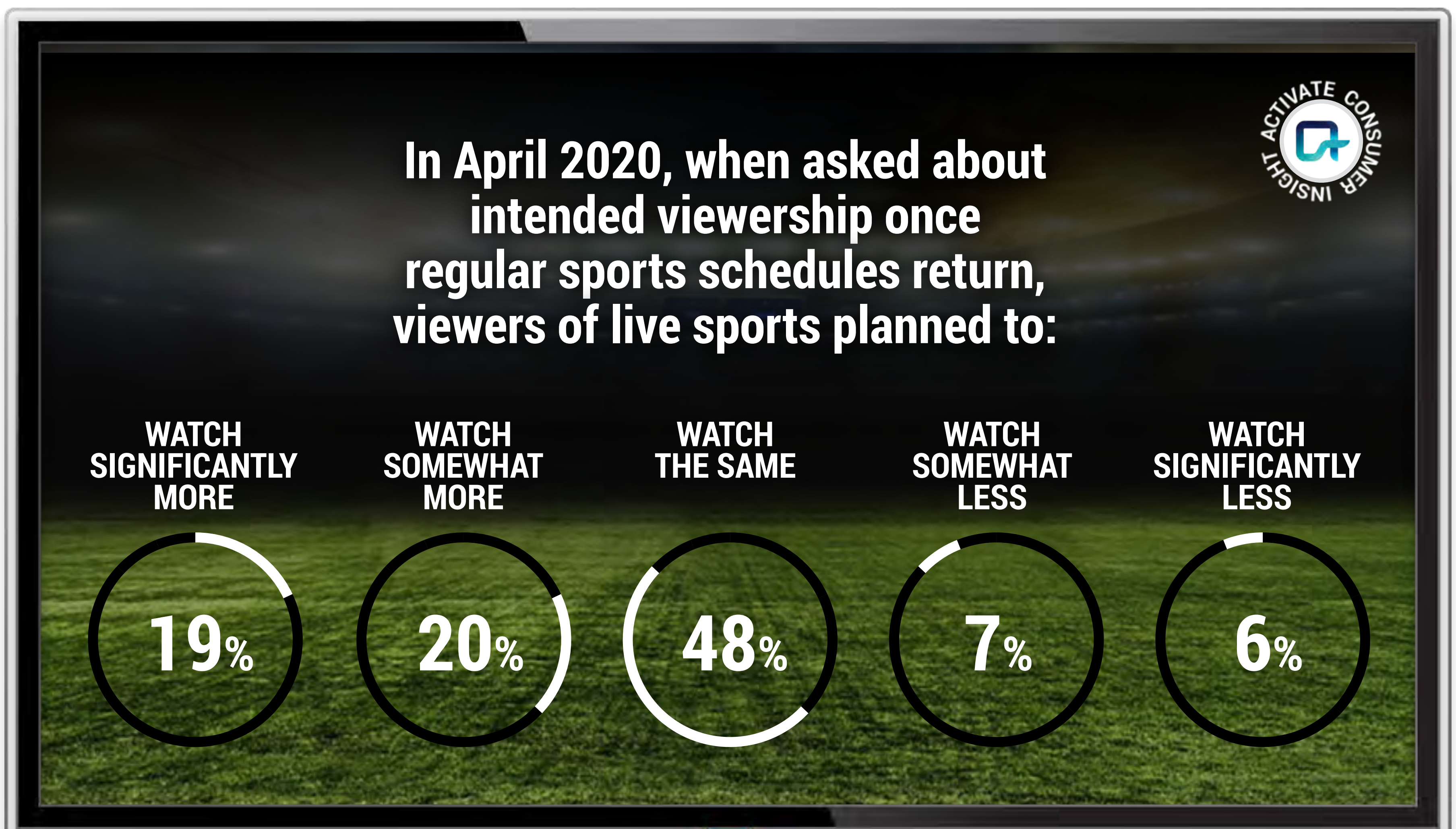
CONTENTS

activate consulting
www.activate.com

Our research, conducted during the sports interruptions related to COVID-19, pointed to significant pent-up demand from live sports viewers

VIEWERSHIP INTENT ONCE LIVE SPORTS RETURN,
U.S., APRIL 2020, % ADULTS AGED 18-64 WHO WATCHED A LIVE SPORTS EVENT IN THE LAST 12 MONTHS

+26% **NET INCREASE[1] IN LIVE SPORTS VIEWERSHIP WHEN SPORTS RETURN**

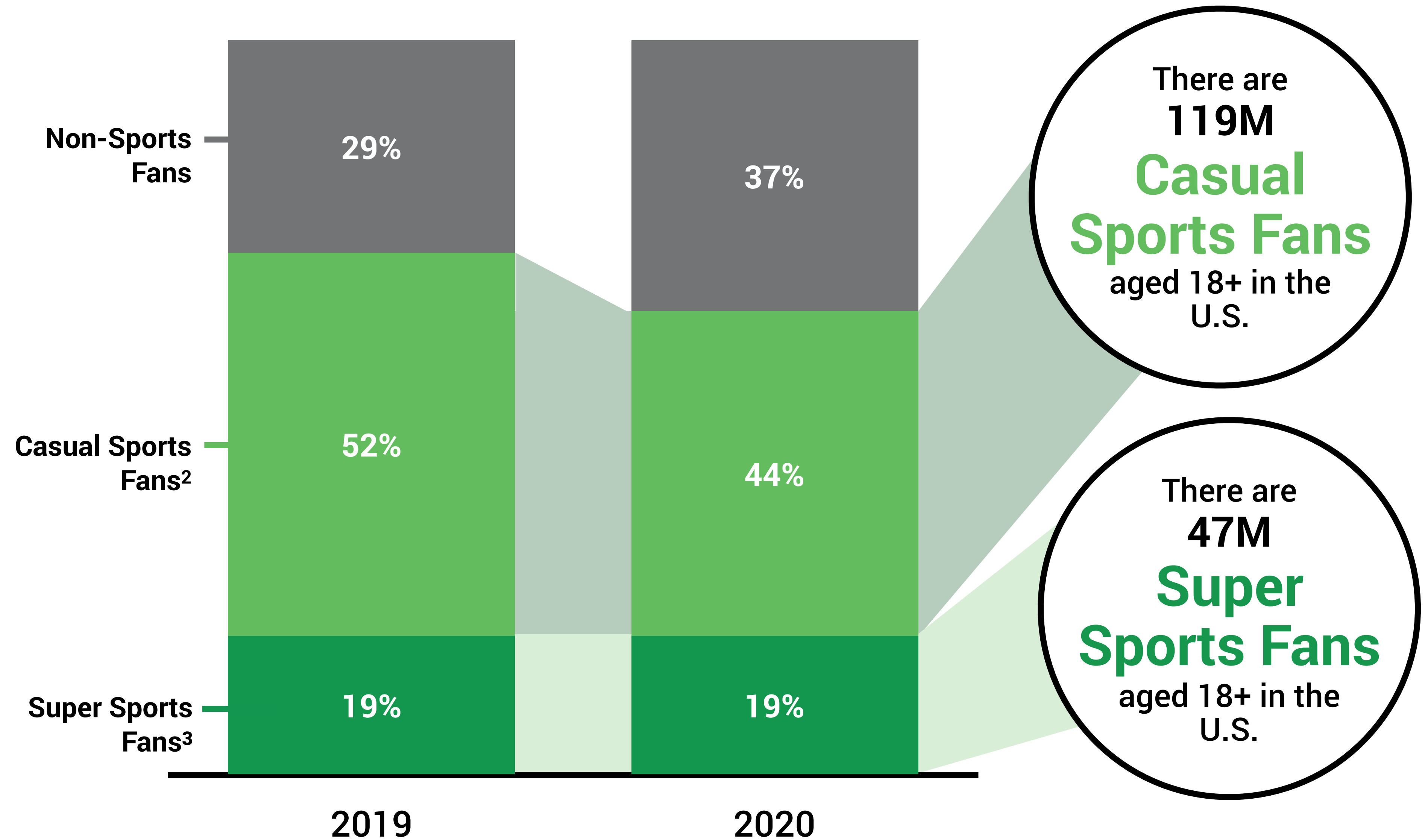


1. "Net increase" reflects intended future viewing compared to viewership in the last 12 months prior to Apr. 2020.
Sources: Activate analysis, Activate COVID-19 Consumer Tech & Media Research Study April 2020 (n = 1,866)

Now that many sports are back, Super Sports Fans have returned, but a number of Casual Sports Fans have not

SPORTS FANDOM BY FAN TYPE, U.S., 2019 VS. 2020, % ADULTS AGED 18+

The total share of Sports Fans[1] has decreased but the total share of Super Sports Fans has stayed the same — Casual Sports Fans have been slow to return as compared to last year

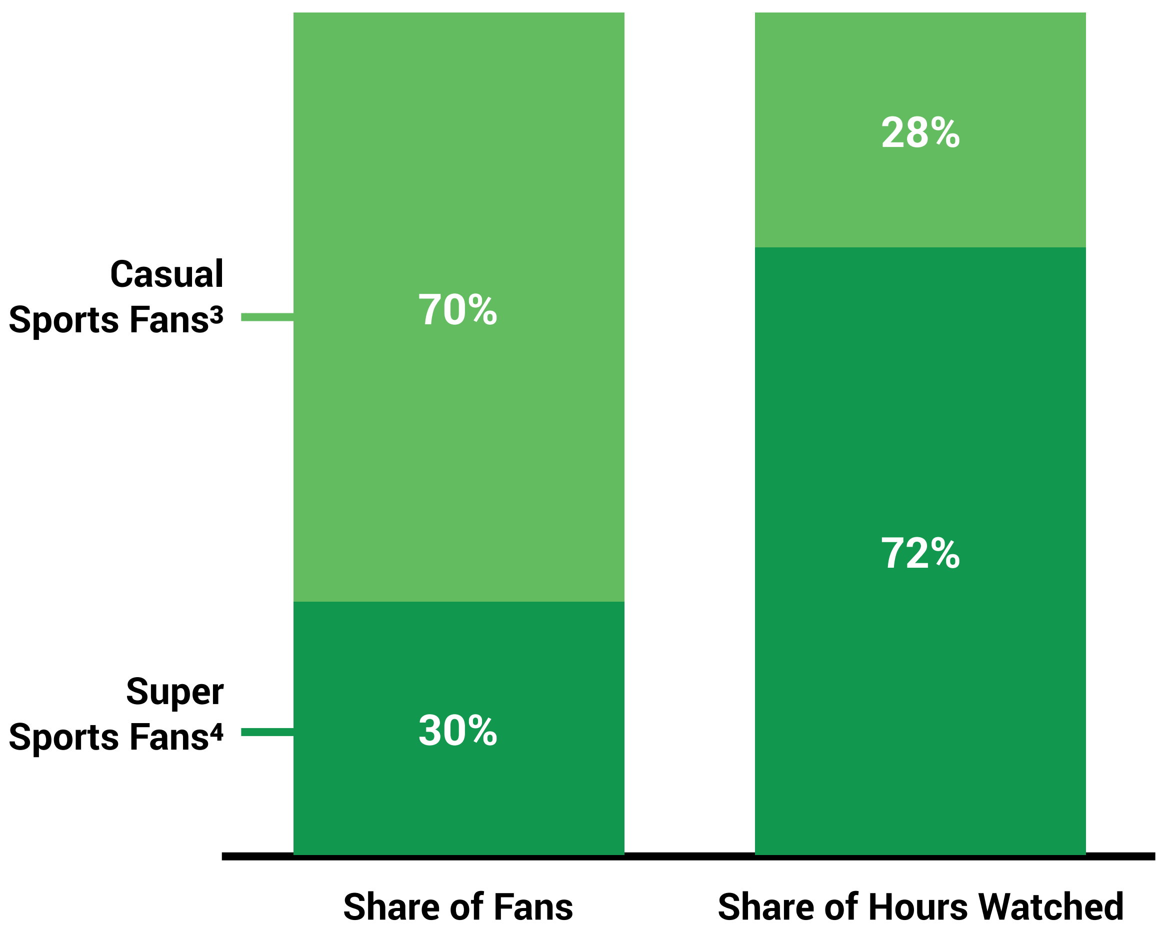


1. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. "Casual Sports Fans" are defined as Sports Fans who watched less than 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020). 3. "Super Sports Fans" are defined as Sports Fans who watched at least 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020).

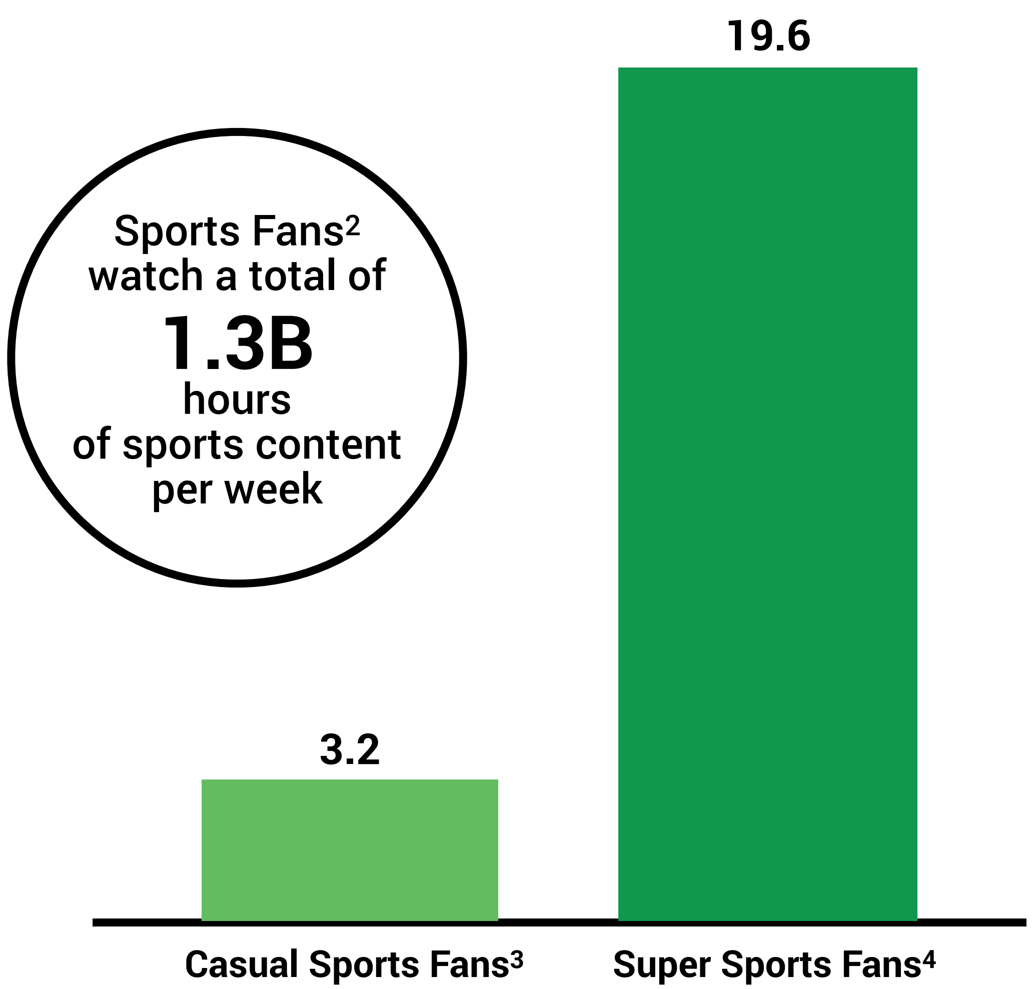
Sources: Activate analysis, Activate 2019 Consumer Tech & Media Research Study (n = 4,006), Activate 2020 Consumer Tech & Media Research Study (n = 4,003), U.S. Census Bureau

Super Sports Fans' engagement remains very strong: they account for 30% of Sports Fans and over 70% of total time spent watching sports content, spending 6x as much time watching sports content as Casual Sports Fans

SHARE OF HOURS OF SPORTS CONTENT[1] WATCHED BY FAN TYPE, U.S., 2020, % SPORTS FANS[2] AGED 18+



AVERAGE WEEKLY HOURS OF SPORTS CONTENT WATCHED BY FAN TYPE, U.S., 2020, HOURS PER WEEK



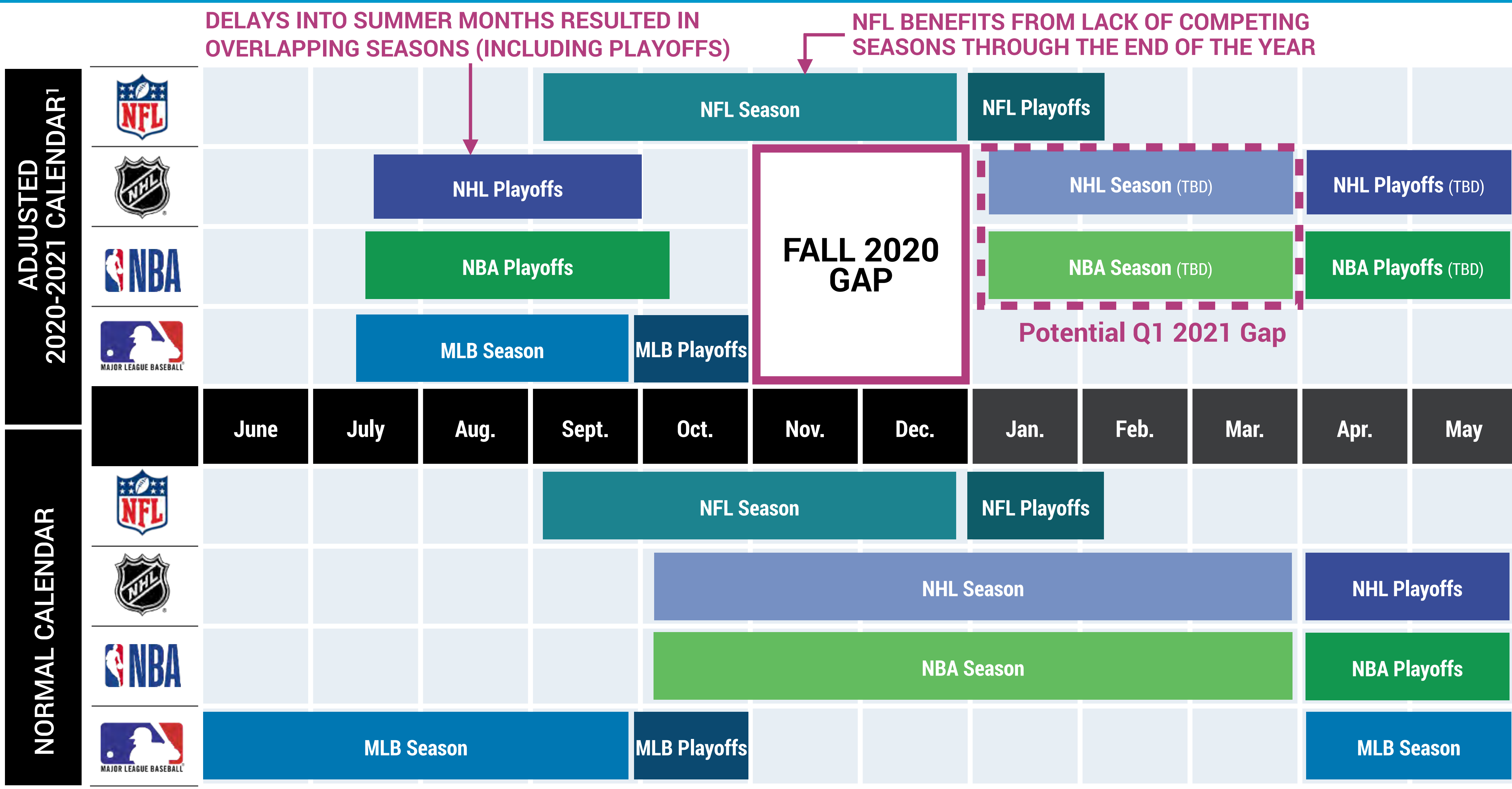
1. Includes media beyond live game broadcasts such as pre-game / post-game shows and sports network programming. 2. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 3. "Casual Sports Fans" are defined as Sports Fans who watched less than 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) before the COVID-19 outbreak (i.e. before Mar. 2020). 4. "Super Sports Fans" are defined as Sports Fans who watched at least 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), U.S. Census Bureau

activate consulting

WSJ TECH LIVE

After the COVID-19 outbreak interruption in Q2 2020, the upcoming 2020-2021 sports calendar will look different, potentially altering how sports are consumed

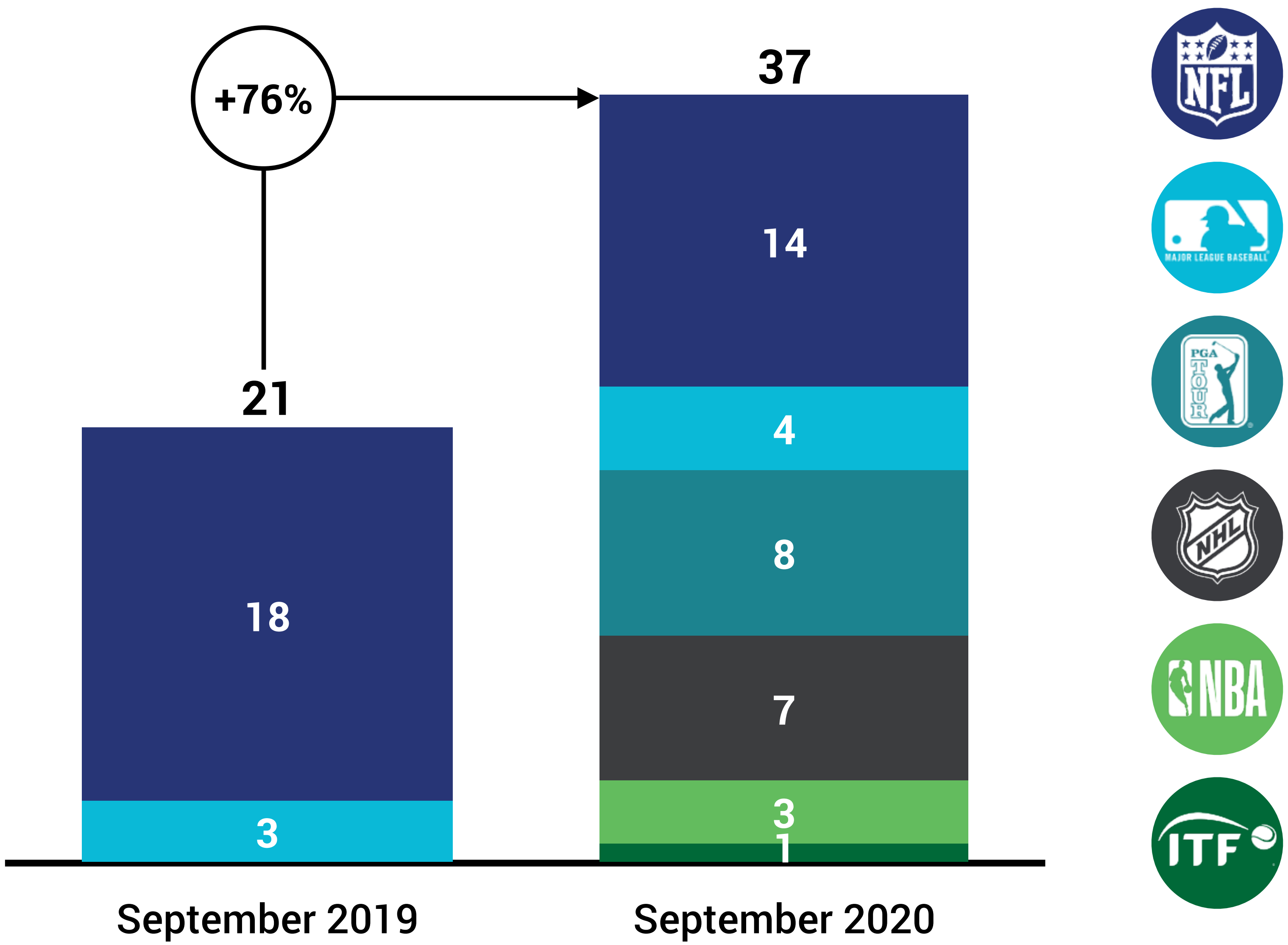
2020-2021 SEASON TIMELINES FOR THE "BIG FOUR" U.S. PROFESSIONAL SPORTS LEAGUES



1. Tentative 2020-2021 calendar is subject to change based on further adjustments to season timelines depending on the COVID-19 outbreak.
Sources: Activate analysis, Company sites

As a result of the sports calendar shift, the number of major live sports events that aired on broadcast TV alone (excluding cable) almost doubled in September 2020 vs. September 2019

PROFESSIONAL SPORTS LIVE EVENT TELECASTS[1] ON MAJOR BROADCAST NETWORKS[2] BY TOP ORGANIZATION[3],
U.S., SEPT. 2019 VS. SEPT. 2020, NUMBER OF EVENTS



1. Includes only telecasts lasting longer than 90 minutes.
2. "Major broadcast networks" defined as ABC, CBS, Fox, and NBC.
3. "Top organizations" defined as the top 6 professional sports organizations by number of telecasts in Sept. 2020.
Sources: Activate analysis, Comscore TV Essentials

For example, in September 2020, a number of scheduling conflicts occurred for major events; while overall sports viewership actually increased, ratings for some specific events were lower than last year

SPORTING EVENT TV VIEWERSHIP BY DAY, SEPT. 2019 VS. SEPT. 2020, U.S., MILLIONS NIELSEN VIEWERS[1]

THURSDAY, WEEK 1 OF THE NFL SEASON

	Event	Viewership 2019	Viewership 2020	YoY % Growth
NFL	Thursday Night Football	22.0M	20.5M	-7%
us open	U.S. Open: Women's Semifinal	1.9M	1.6M	-17%
NBA	Conference Finals		2.5M	
NHL	Conference Finals		0.8M	
	COMBINED VIEWERSHIP[2]	23.9M	25.4M	+6%

SUNDAY, WEEK 2 OF THE NFL SEASON

	Event	Viewership 2019	Viewership 2020	YoY % Growth
NFL	Sunday Night Football	17.6M	17.7M	+0%
NBA	Conference Finals		3.2M	
	COMBINED VIEWERSHIP[2]	17.6M	20.9M	+19%

THURSDAY, WEEK 2 OF THE NFL SEASON

	Event	Viewership 2019	Viewership 2020	YoY % Growth
NFL	Thursday Night Football	6.6M	6.7M	+2%
NBA	Conference Finals		3.5M	
NHL	Conference Finals		1.2M	
	COMBINED VIEWERSHIP[2]	6.6M	11.4M	+73%

SUNDAY, WEEK 3 OF THE NFL SEASON

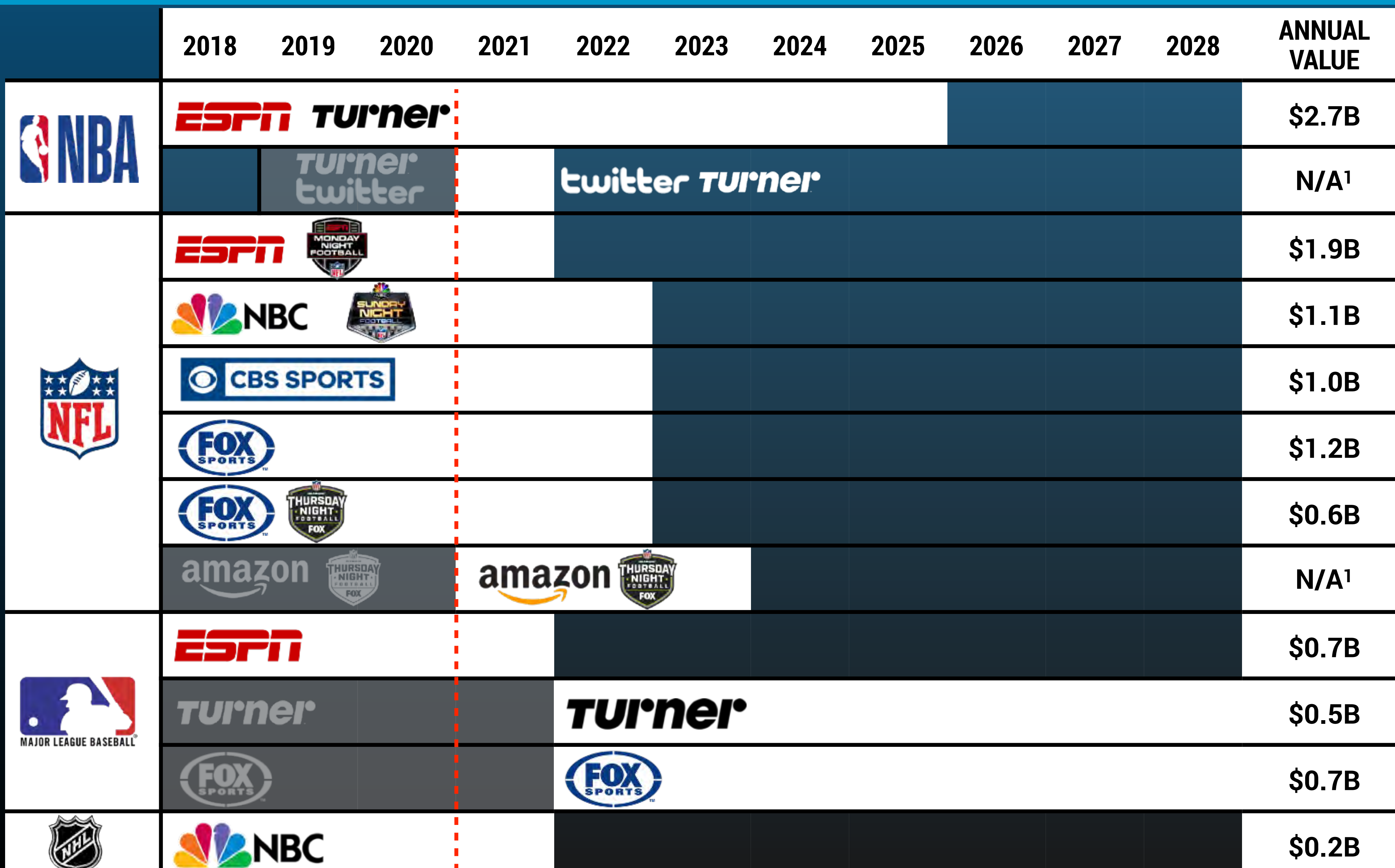
	Event	Viewership 2019	Viewership 2020	YoY % Growth
NFL	Sunday Night Football	18.5M	17.8M	-4%
NBA	Conference Finals		3.2M	
	COMBINED VIEWERSHIP[2]	18.5M	21.0M	+14%

EVENTS RESCHEDULED FROM Q2 2020 DUE TO THE COVID-19 OUTBREAK

1. "Nielsen viewers" are defined as viewers who tuned into a program for at least one minute as measured by Nielsen.
2. "Combined viewership" may include viewers watching multiple events.
Sources: Activate analysis, Nielsen, Sports Media Watch

Today, the largest sporting events happen on the major broadcast networks – rights deal renegotiations in the coming years will be critical to defend the Pay TV bundle

SELECT CONTENT RIGHTS TIMELINES AND ANNUAL VALUE BY SPORT, U.S., 2018-2028, BILLIONS USD



The NFL and NHL are reportedly ***delaying negotiations*** until at least 2021 to let sports viewership demand return before signing new deals

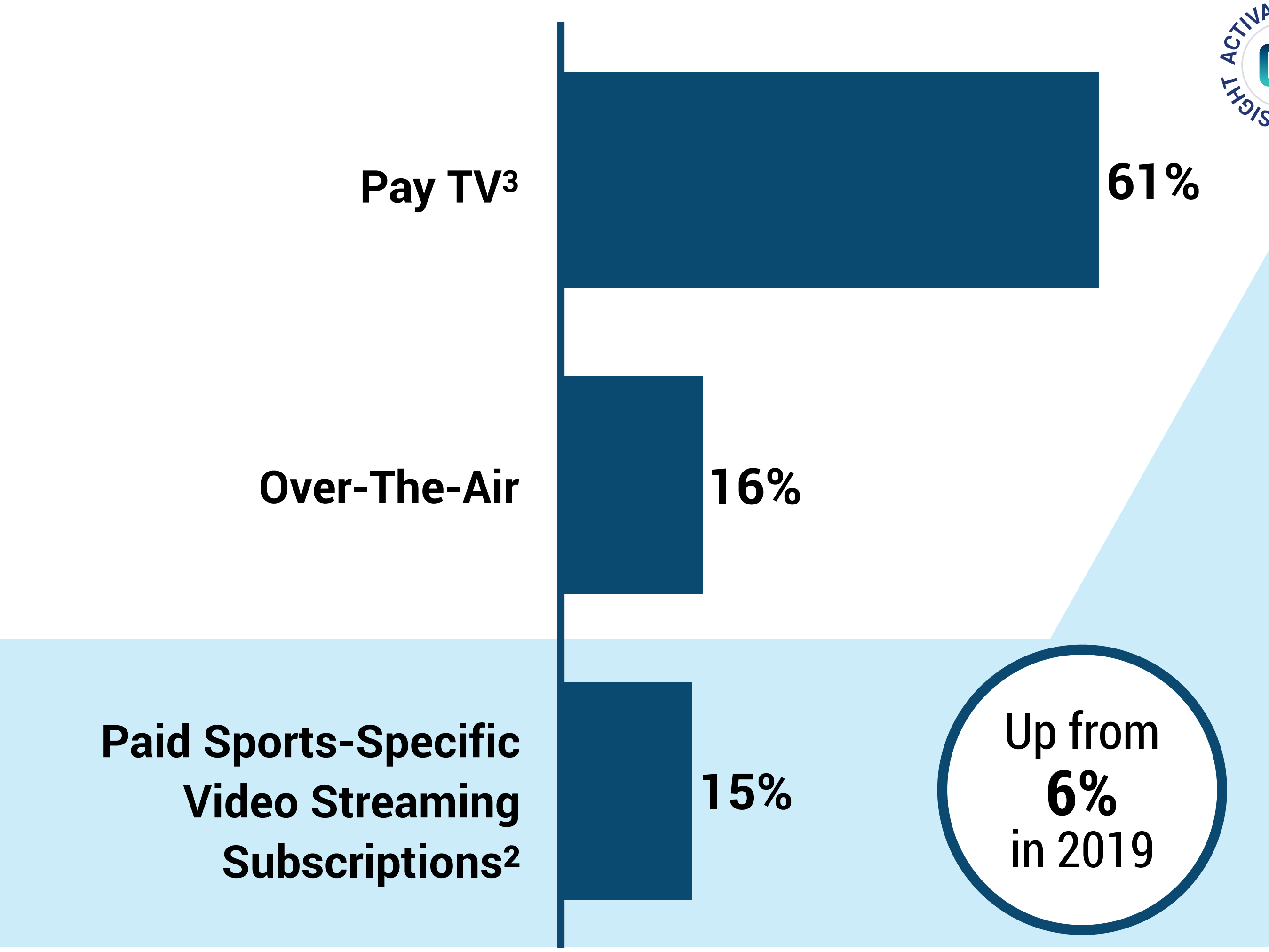
Tech platforms such as Amazon and Twitter are establishing themselves as competitors to the major incumbents

Indicates previous deal in place with same distributor (that has since been renewed)

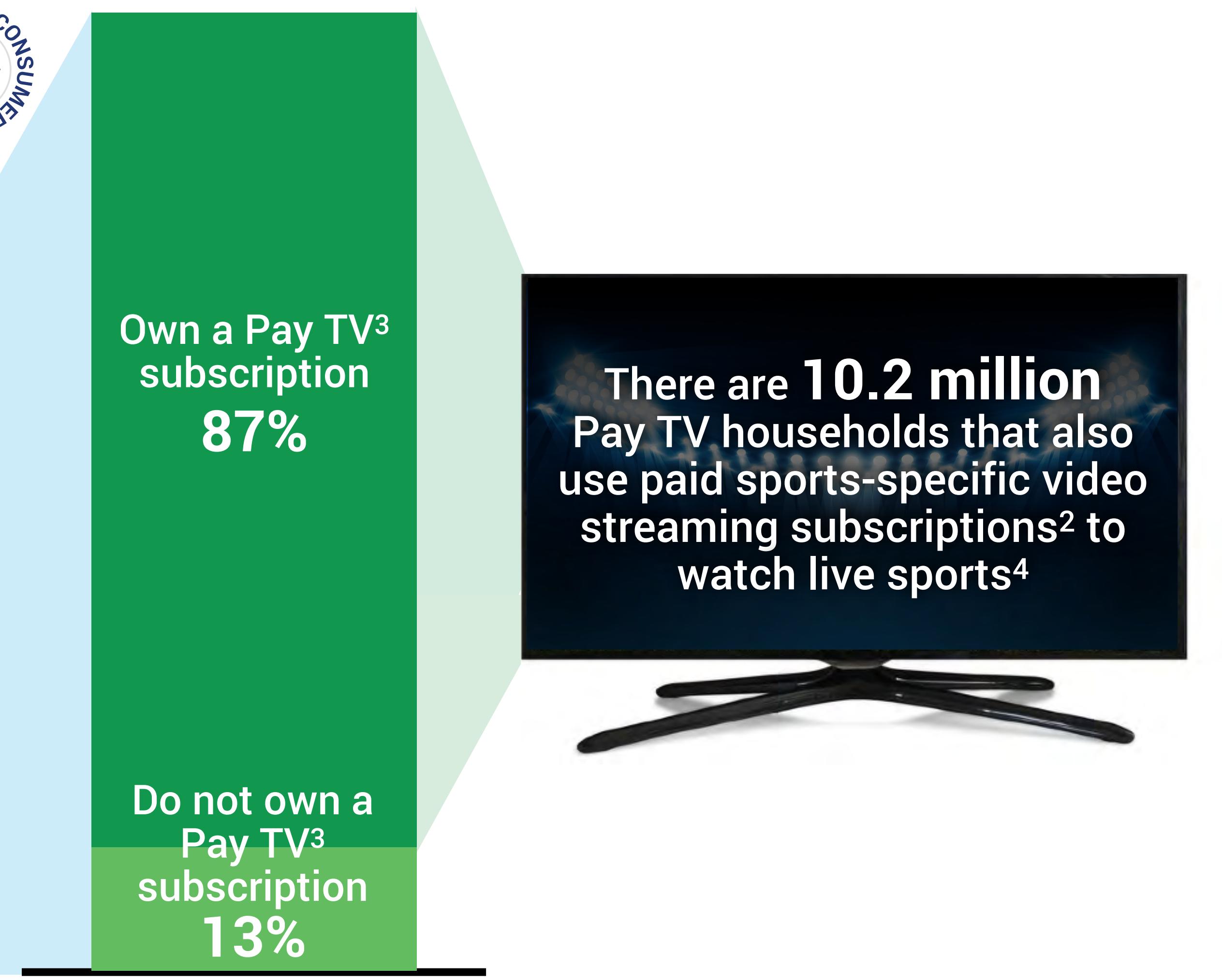
1. Public information for streaming deals does not include financial terms.
Sources: Activate analysis, Axios, Company press releases, Sports Business Journal

Given current rights deals, Sports Fans primarily watch live sports on cable; at the same time, fans increasingly use multiple sports video streaming services to supplement their Pay TV subscriptions

LIVE SPORTS VIEWERSHIP BY DELIVERY TYPE,
U.S., 2020, % SPORTS FANS[1] AGED 18+



PAY TV[3] SUBSCRIPTION OWNERSHIP,
U.S., 2020, % SPORTS FANS[1] AGED 18+ THAT USE PAID SPORTS-SPECIFIC VIDEO STREAMING SUBSCRIPTIONS[2]

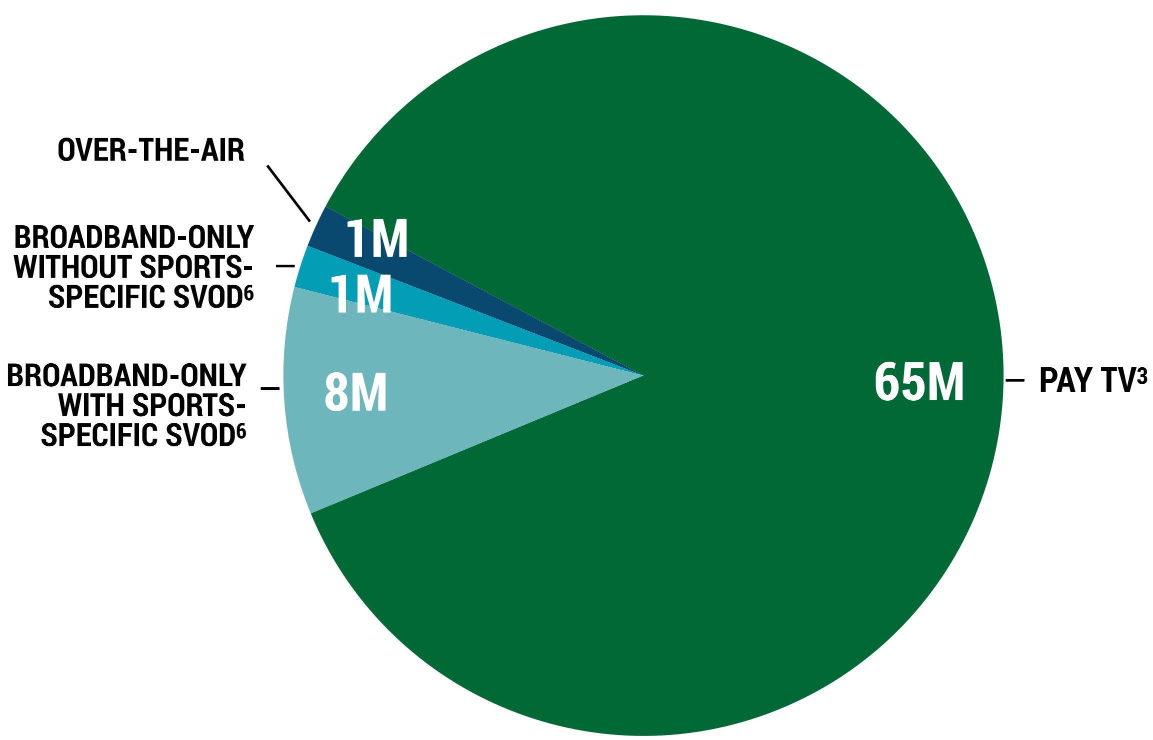


1. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. Includes usage of paid video streaming subscriptions specifically for sports in the last 12 months, not free services included with Pay TV subscriptions or general video streaming subscriptions that host live sports content. 3. "Pay TV" includes traditional Pay TV households and virtual Pay TV households. 4. Only includes consumers who indicate they have used subscriptions to watch live sports, not overall subscribers.
Sources: Activate analysis, Activate 2019 Consumer Tech & Media Research Study (n = 4,006), Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Leichtman Research Group, MoffettNathanson, Nielsen, Parks Associates, S&P Global, U.S. Census Bureau

Sports Fans are primarily Pay TV subscribers, creating a floor for Pay TV subscribers amidst cord-cutting trends

HOUSEHOLD BREAKDOWN OF SPORTS FANS[1], U.S., 2020E, MILLIONS HOUSEHOLDS

76M Sports TV Households[2]



KEY QUESTIONS FOR THE FUTURE OF SPORTS TV HOUSEHOLDS:

- Could live offerings by streaming services erode Pay TV[3] penetration among Super Sports Fans[4]?
- What will it take for Casual Sports Fans[5] to keep their Pay TV[3] subscriptions given cord-cutting trends?
- What are the types of customer propositions that could engage more sports TV battleground households?

SPORTS TV HOUSEHOLDS	% CASUAL SPORTS FANS[5]	% SUPER SPORTS FANS[4]
OVER-THE-AIR	79%	21%
BROADBAND-ONLY WITHOUT SPORTS-SPECIFIC SVOD[6]	82%	18%
BROADBAND-ONLY WITH SPORTS-SPECIFIC SVOD[6]	59%	41%
PAY TV[3]	69%	31%

Super Sports Fans[4] are concentrated in Pay TV[3] households and broadband households with sports-specific SVOD[6]

1. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. Figures do not sum due to rounding. 3. "Pay TV" includes traditional Pay TV households and virtual Pay TV households. 4. "Super Sports Fans" are defined as Sports Fans who watched at least 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020). 5. "Casual Sports Fans" are defined as Sports Fans who watched less than 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020). 6. "SVOD" is defined as a paid video streaming subscription.

Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Leichtman Research Group, MoffettNathanson, Nielsen, Parks Associates, S&P Global, U.S. Census Bureau

Sport experience innovation will drive more viewership, bringing back Casual Sports Fans and driving even more engagement from Super Sports Fans

NEW ADVANCED VIEWING ENHANCEMENTS

Tech-driven at-home viewing improvements are providing **fans** with more **options** and **features** when watching their favorite sports

INTERACTIVE SPORTS BETTING EXPERIENCES

Media companies are increasing **sports betting programming** and integrating **betting commentary** into **live broadcasts**

NEW TECH-ENABLED IN-PERSON EXPERIENCES

Sports teams are providing **technology solutions** to improve **in-person viewing experiences** like **mobile concession ordering** and **mobile retail**

UPDATED SCHEDULES TO ACCOMMODATE THE MAJOR EVENTS

Leagues, inspired by **scheduling creativity** to account for the COVID-19 outbreak, are actively **assessing their schedules** to **optimize** potential **viewership**

NEW SPORTS

Drone racing, esports, parkour, and other emerging sports are **attracting younger fans** across **digital and linear media outlets**

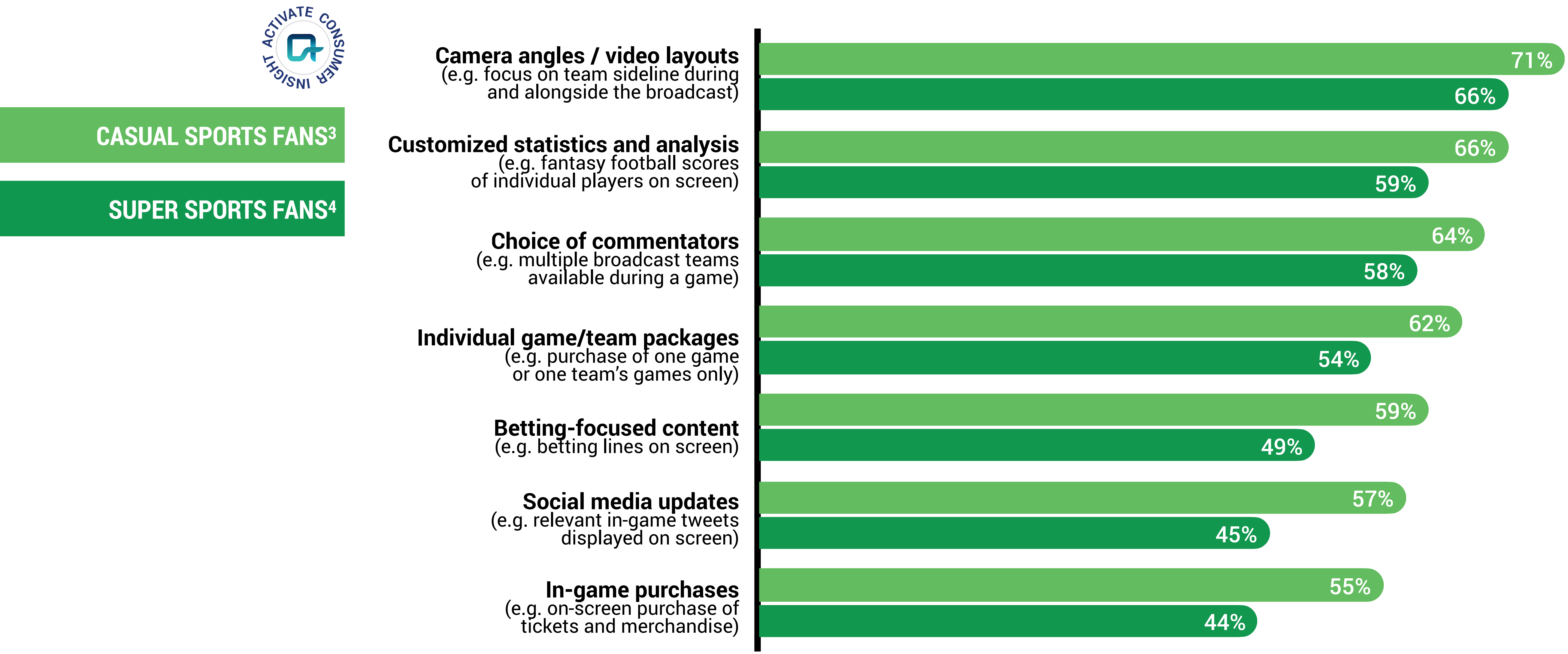
SPORTS-TAINMENT

Sports-themed TV shows like Holey Moley and Ultimate Tag are **generating strong viewership numbers**

Source: Activate analysis

Fans demonstrate strong interest in new advanced viewing experiences – these hold the potential to increase fan engagement, even more so for Casual Sports Fans

INTEREST IN LIVE SPORTS VIDEO FEATURES, U.S., 2020, % SPORTS FANS[1] AGED 18+ WHO WATCH LIVE SPORTS[2]



1. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. Only includes Sports Fans who indicated they have watched a live sports event in any video media format in the last 12 months. 3. "Casual Sports Fans" are defined as Sports Fans who watched less than 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020). 4. "Super Sports Fans" are defined as Sports Fans who watched at least 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Sports Tech: The next generation of sports technology will transform the fan experience both at home and in person

EXAMPLES OF NEW AT-HOME LIVE GAME EXPERIENCES

NextVR and the NBA added regular season coverage of **3D/panoramic camera angles and real-time stats** through Oculus after testing the product during the 2019 Playoffs

NTT Ltd. built a virtual "global stadium" to stream the 2020 Tour de France through an augmented reality app with real-time 3D roadside and in-air views

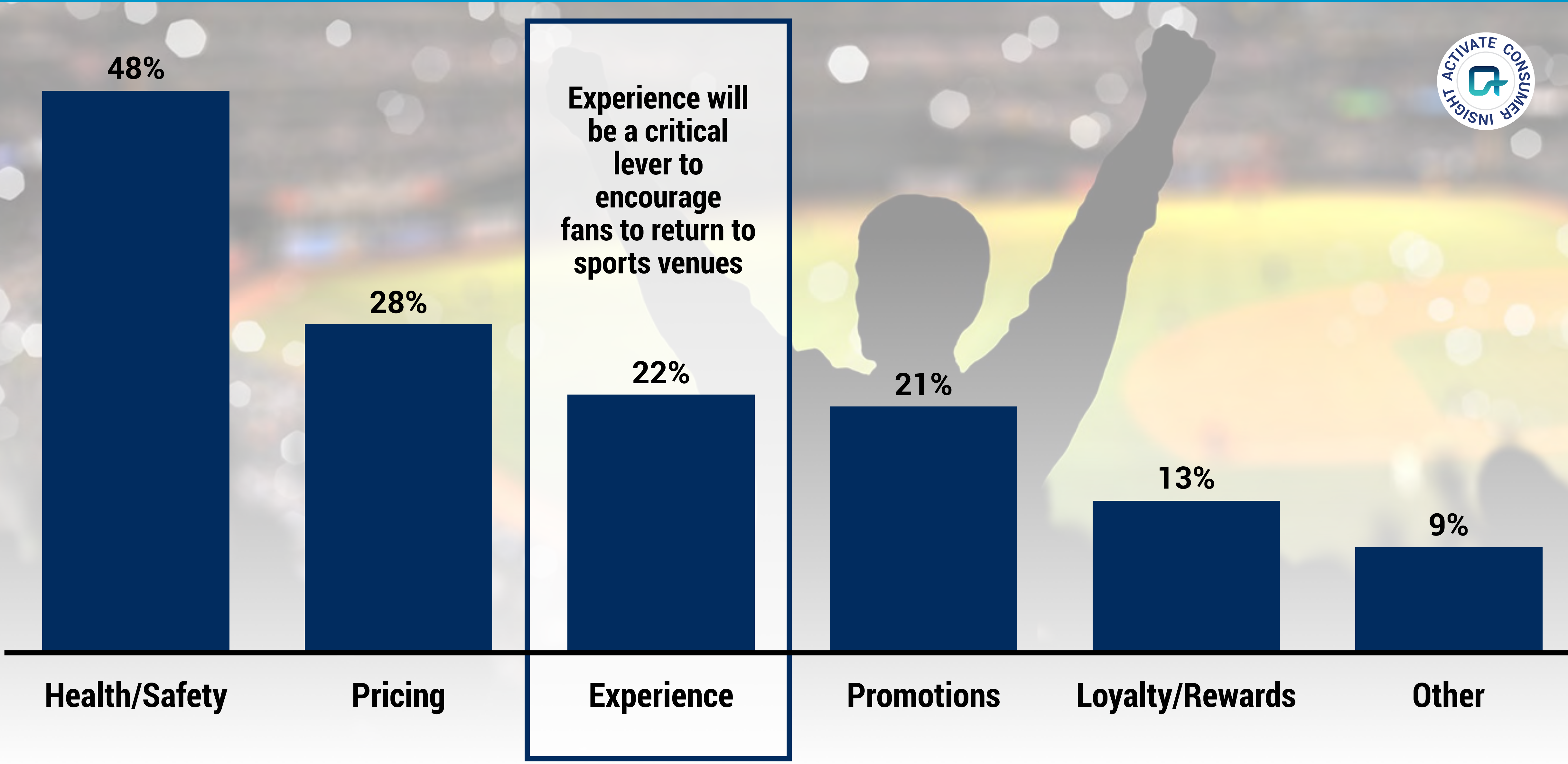
In 2020, **Verizon launched its NFL Watch Together feature through the Yahoo Sports app, allowing synchronized livestream and video chat** for up to four users at a time

Amazon Prime Video **offers multiple commentary options** for its broadcast of Thursday Night Football, **allowing fans to choose which commentary team they prefer**

NBA League Pass offers single game purchase or a 10-minute window of live content, catering to consumers who might have a bet on the game or want to watch small samples of live games

Once health and safety concerns have been addressed, pricing, experience, and promotions will be the most important triggers to bring consumers back to in-person sporting events

FACTORS THAT WOULD ENCOURAGE ATTENDANCE AT LIVE SPORTING EVENTS AFTER THE COVID-19 OUTBREAK[1],
U.S., 2020, % ADULTS AGED 18-64 WHO ATTENDED LIVE SPORTING EVENTS BEFORE THE COVID-19 OUTBREAK[2]



1. "After the COVID-19 outbreak" refers to the 12-month period after the end of the COVID-19 outbreak and subsequent social distancing measures. 2. "Before the COVID-19 outbreak" refers to the period before the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. before Mar. 2020).
Sources: Activate analysis, Activate COVID-19 Consumer Tech & Media Research Study May 2020 (n = 1,925)

Venues will continue to deploy tech-enabled services to transform the in-person experience

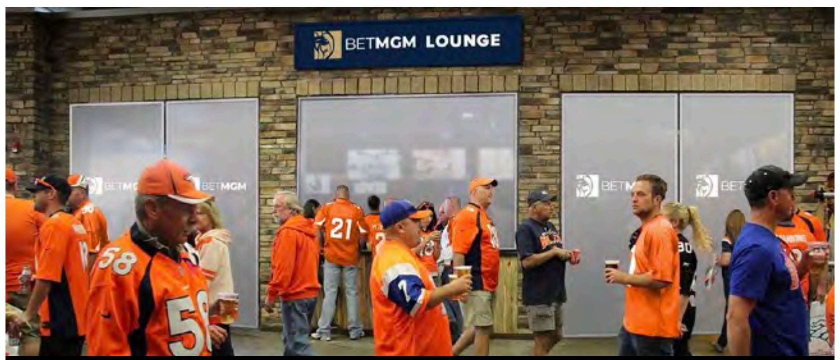
SELECT TECH-ENABLED IN-VENUE SERVICES

Fan Connectivity

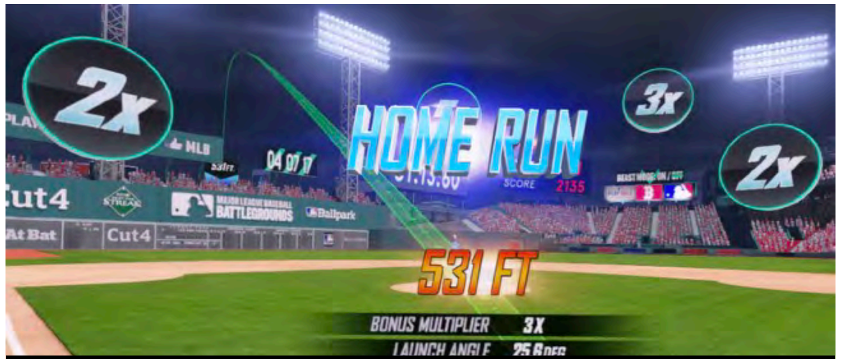
Cisco has implemented Wi-Fi 6 at SoFi Stadium in Los Angeles — the network is designed to meet the needs of fans using mobile devices to **place food and beverage orders, purchase merchandise, and stream videos**

Verizon has deployed 5G Ultra Wideband networks in 20+ stadiums and arenas since the end of 2019 to increase connectivity and download speeds for fans in attendance

Interactive Experiences

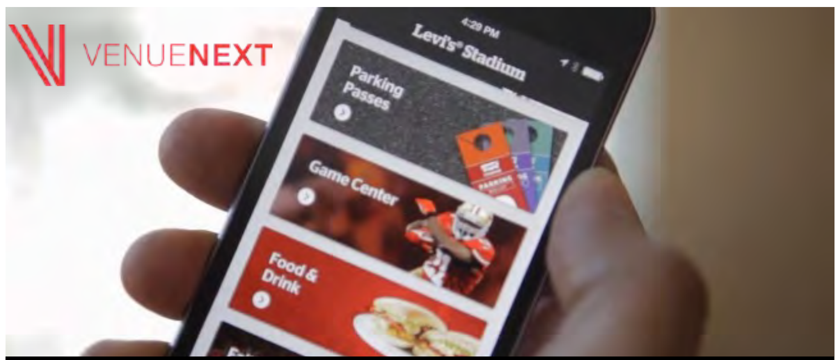


Denver Broncos are building the NFL's first in-stadium luxury betting lounge with BetMGM where live odds will be shown and assistance on how to use MGM's betting app will be available

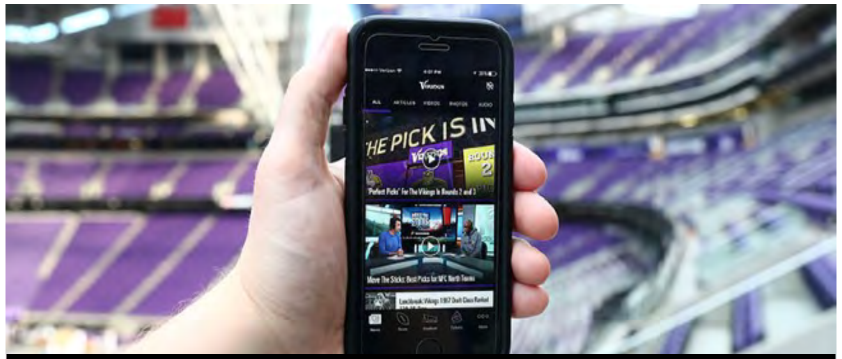


The **Boston Red Sox** have installed a **virtual reality (VR) experience in their ballpark** via its VR Home Run Challenge game for kids

Digital Services



VenueNext's mobile ordering platform has been introduced across NFL, MLB, NHL, and NBA home venues to allow fans **to order food and beverage from their seats and not just in premium sections**

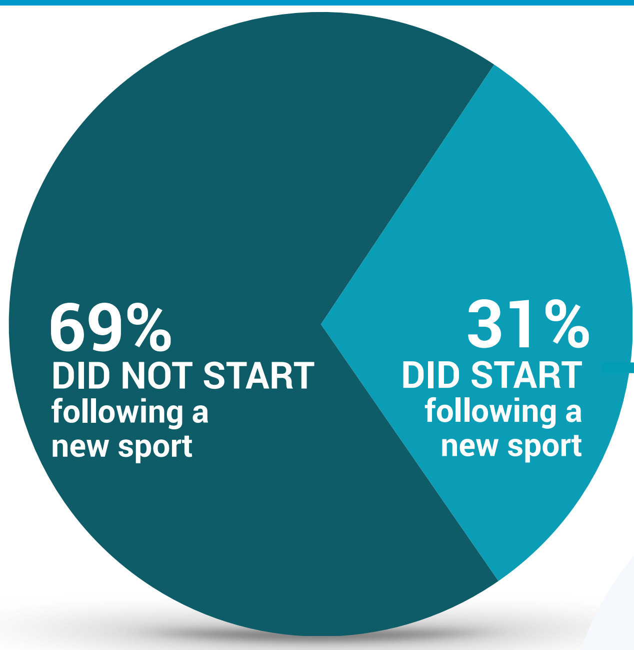


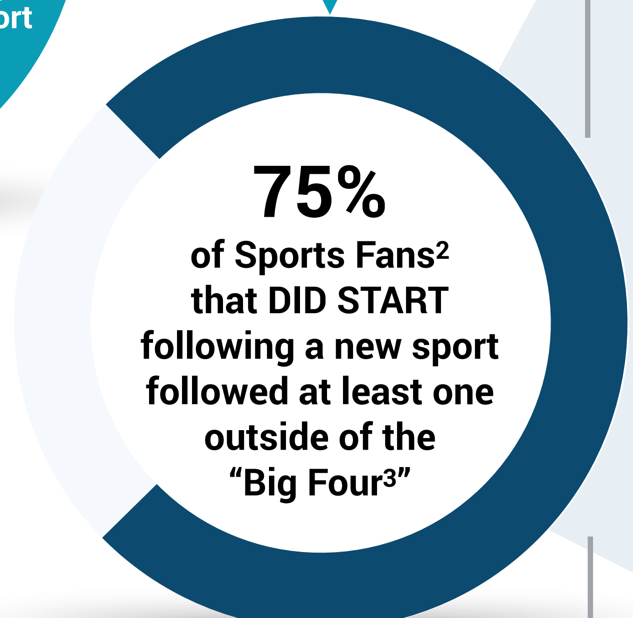
Vikings Mobile App helps fans find the least crowded concessions and bathrooms, and alerts fans to the fastest ingress/egress locations to and from the stadium

Sources: Activate analysis, Company press releases, Company sites

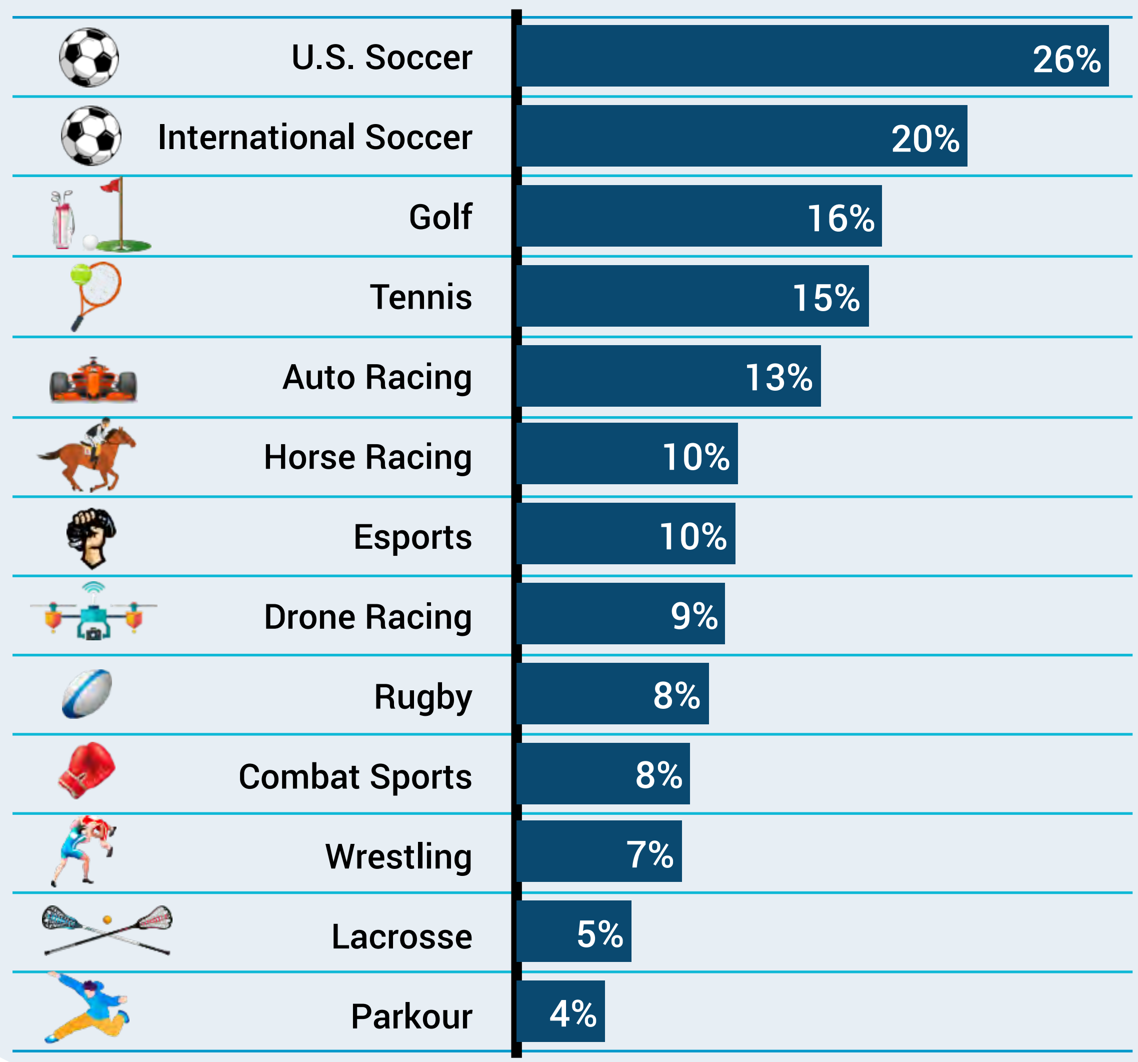
The COVID-19 outbreak has facilitated fan interest in sports outside of the major sports, with early-returning sports such as soccer and golf showing the greatest gains in new followers

SPORTS FANS WHO STARTED FOLLOWING AT LEAST ONE NEW SPORT DURING THE COVID-19 OUTBREAK[1], U.S., 2020, % SPORTS FANS[2] AGED 18+





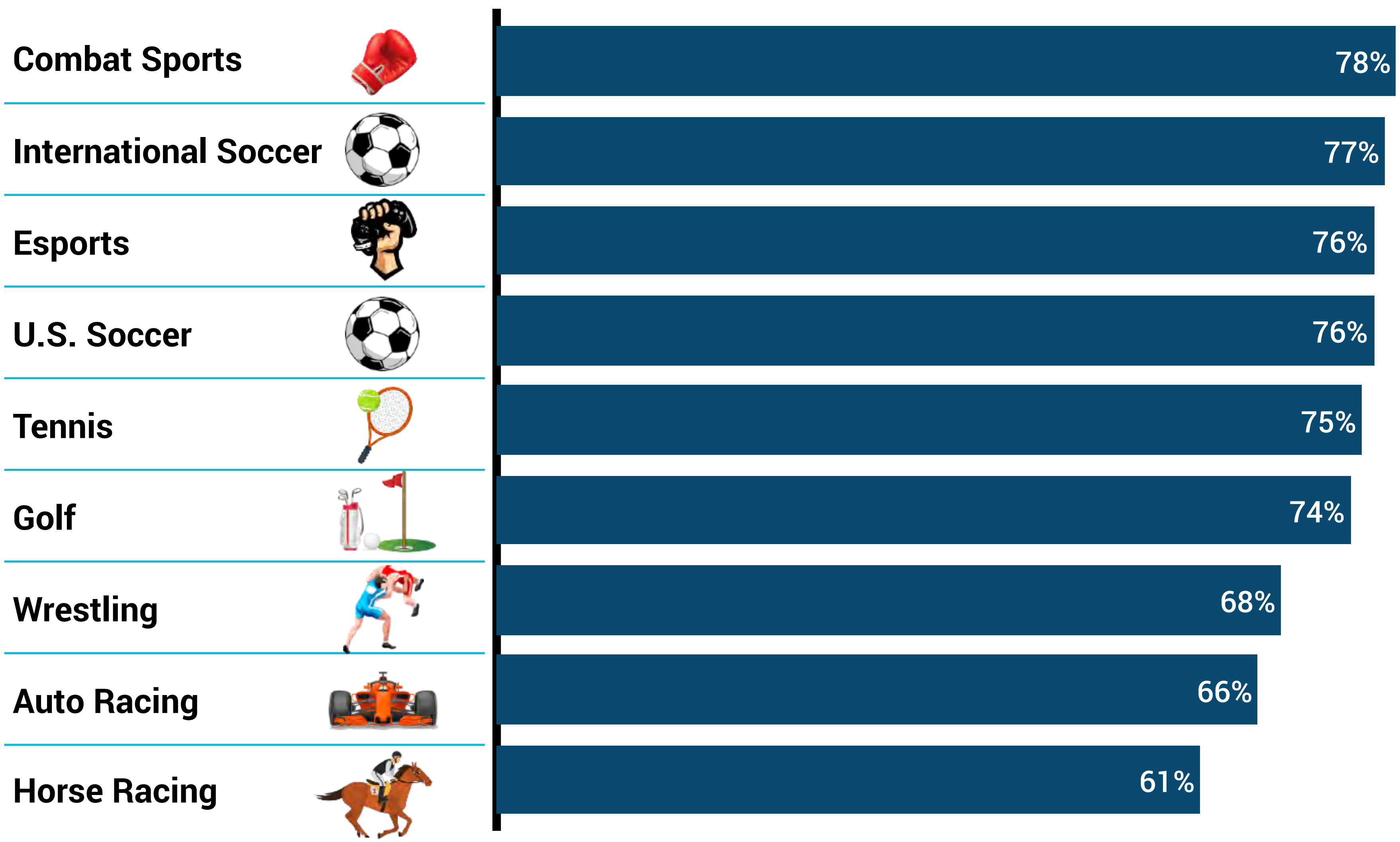
SPORTS FOLLOWED EXCLUDING THE "BIG FOUR[3]" DURING THE COVID-19 OUTBREAK[1], U.S., 2020, % SPORTS FANS[2] AGED 18+ WHO STARTED FOLLOWING AT LEAST ONE NEW SPORT OUTSIDE OF THE "BIG FOUR"



1. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). 2. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 3. "Big Four" sports include football, baseball, basketball, and hockey.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Sports Fans indicate that they will continue to watch the sports they picked up during the COVID-19 outbreak

LIKELIHOOD TO CONTINUE WATCHING NEW SPORTS FOLLOWED DURING THE COVID-19 OUTBREAK[1],
U.S., 2020, % SPORTS FANS[2] AGED 18+ WHO STARTED FOLLOWING EACH SPORT

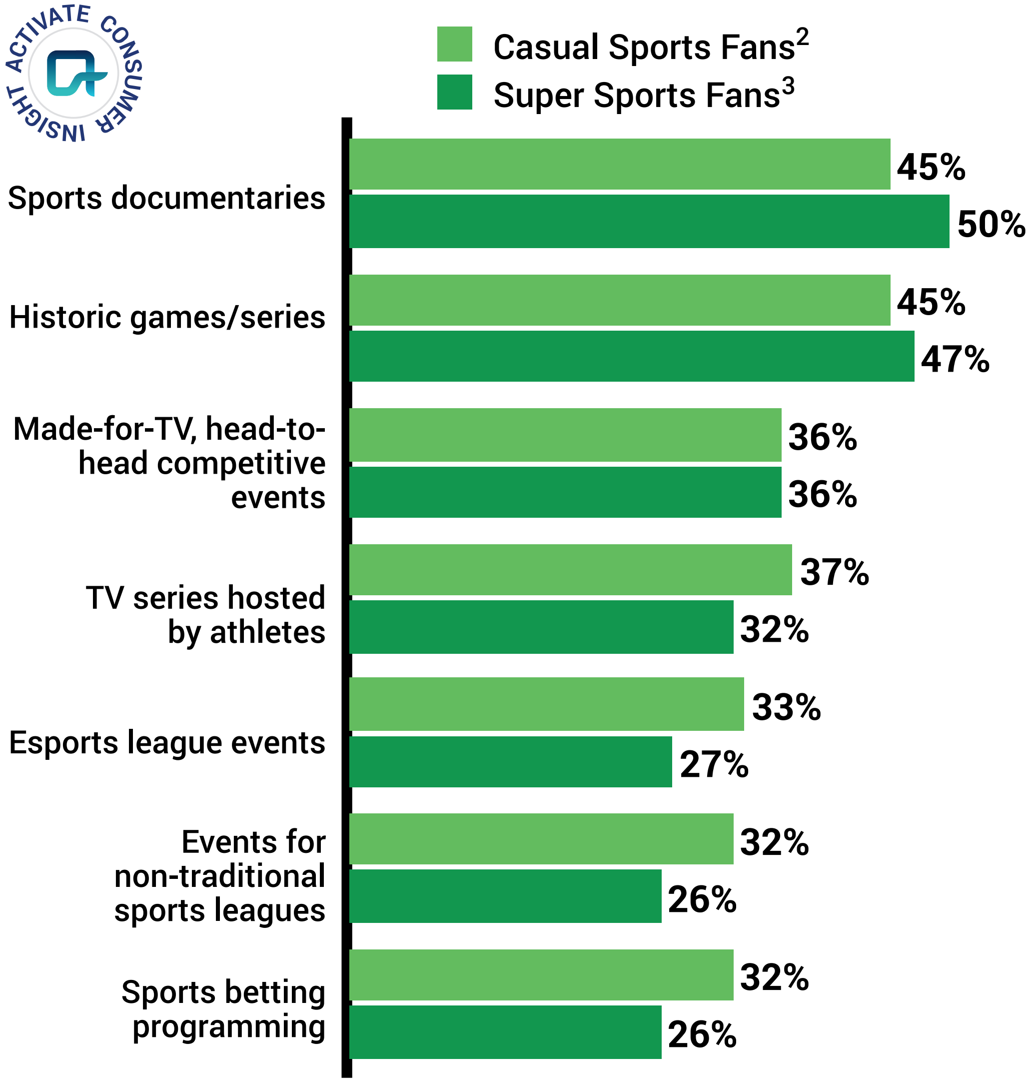


ACTIVATE CONSUMER INSIGHT

1. "During the COVID-19 outbreak" refers to the period since the start of the COVID-19 outbreak and subsequent social distancing measures (i.e. since Mar. 2020). Drone racing, parkour, rugby, and lacrosse are excluded due to insufficient sample size for U.S.-based viewers. "Big Four" sports (i.e. football, baseball, basketball, and hockey) are also excluded.
2. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

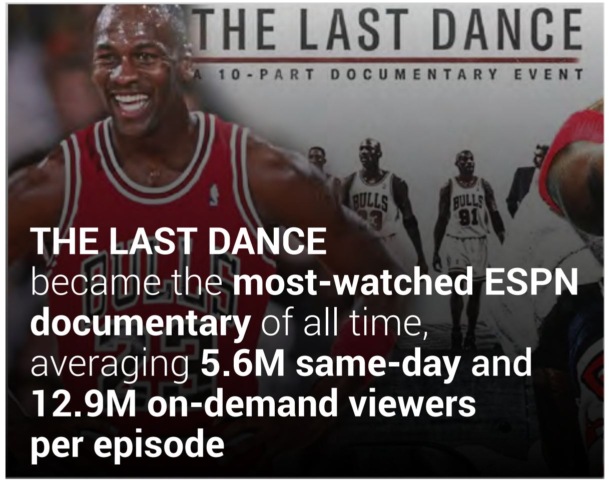
Casual Sports Fans and Super Sports Fans enjoy alternative sports programming; major programs have attracted audiences of a similar scale to major live sports events

INTEREST IN ALTERNATIVE SPORTS PROGRAMMING, U.S., 2020, % SPORTS FANS[1] AGED 18+ WHO WATCHED LIVE SPORTS CONTENT IN THE LAST 12 MONTHS

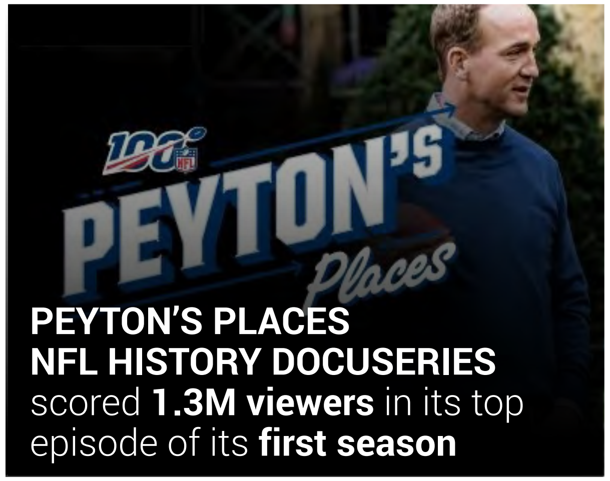


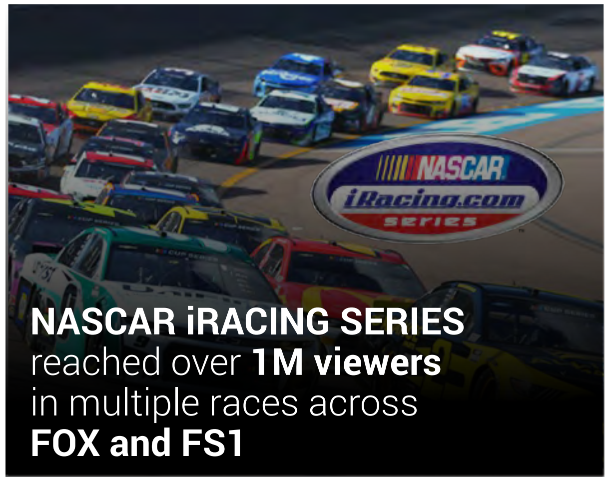
EXAMPLES OF ALTERNATIVE SPORTS PROGRAMMING

HISTORICAL SPORTS DOCUMENTARIES



ALTERNATIVE FORMAT COMPETITIONS





1. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. "Casual Sports Fans" are defined as Sports Fans who watched less than 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020). 3. "Super Sports Fans" are defined as Sports Fans who watched at least 10 hours of live sports and sports content (e.g. pre-game and post-game shows, sports network programming) per week before the COVID-19 outbreak (i.e. before Mar. 2020).
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003), Nielsen

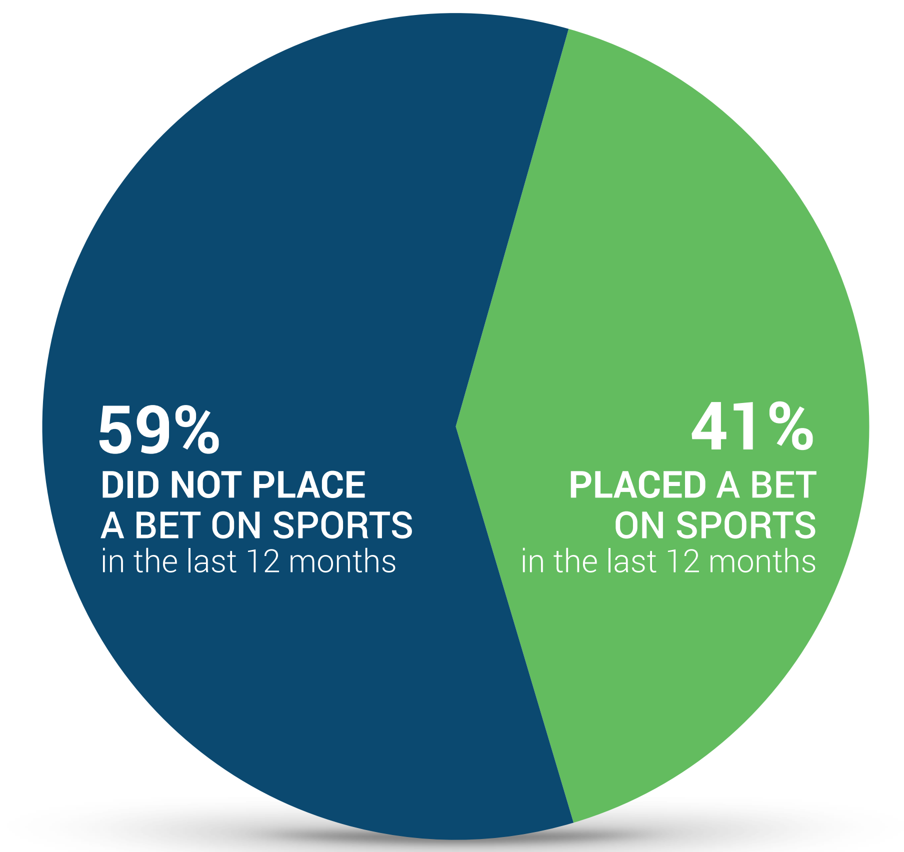
activate consulting
www.activate.com

CONTENTS

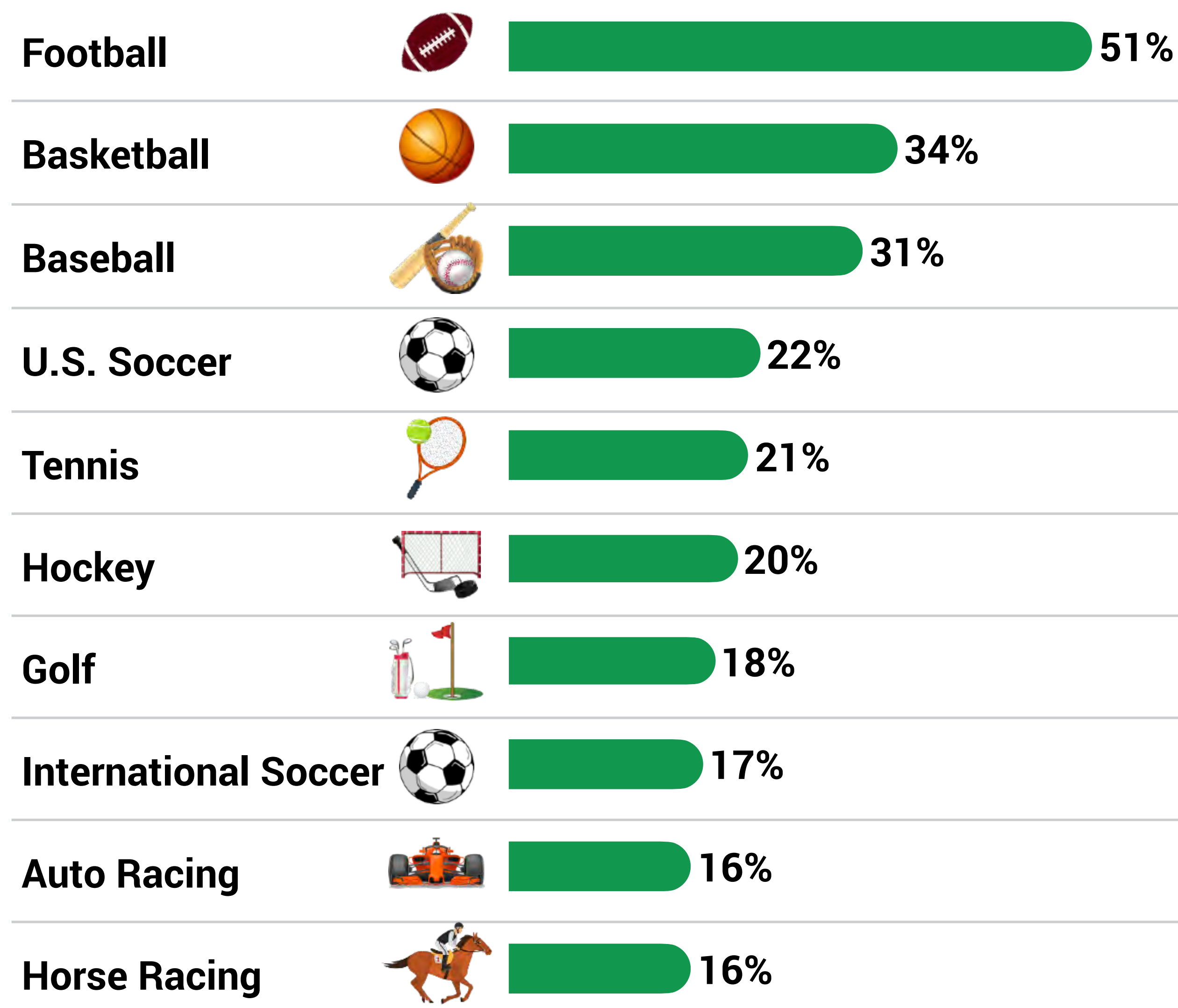
PAGE

Over 40% of Sports Fans bet on sports (legal and illegal) and are betting across a broad range of sports

SPORTS FANS[1] WHO PLACE BETS,
U.S., 2020, % SPORTS FANS[1] AGED 18+



SPORTS[2] WAGERED ON BY SPORTS BETTORS[3],
U.S., 2020, % SPORTS BETTORS[3] AGED 18+

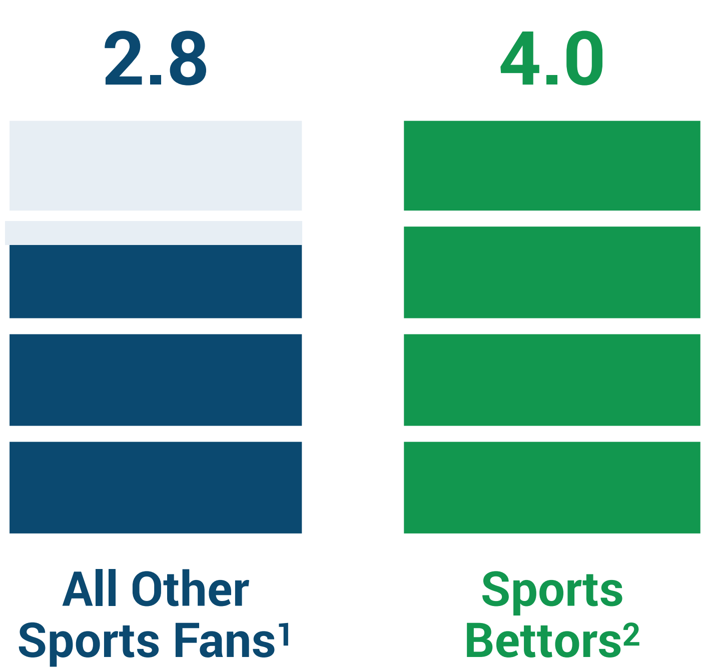


Note: Betting excludes fantasy sports - only wagers placed outside of fantasy sports are considered here.
1. “Sports Fans” are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. Includes the top 10 sports by share of Sports Bettors participating. All other sports did not reach a 15% or greater share of Sports Bettors. 3. “Sports Bettors” are defined as Sports Fans who have placed a bet on at least one sport in the last 12 months.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Sports Bettors are an especially engaged group: they follow more sports and watch more live sports than non-Sports Bettors

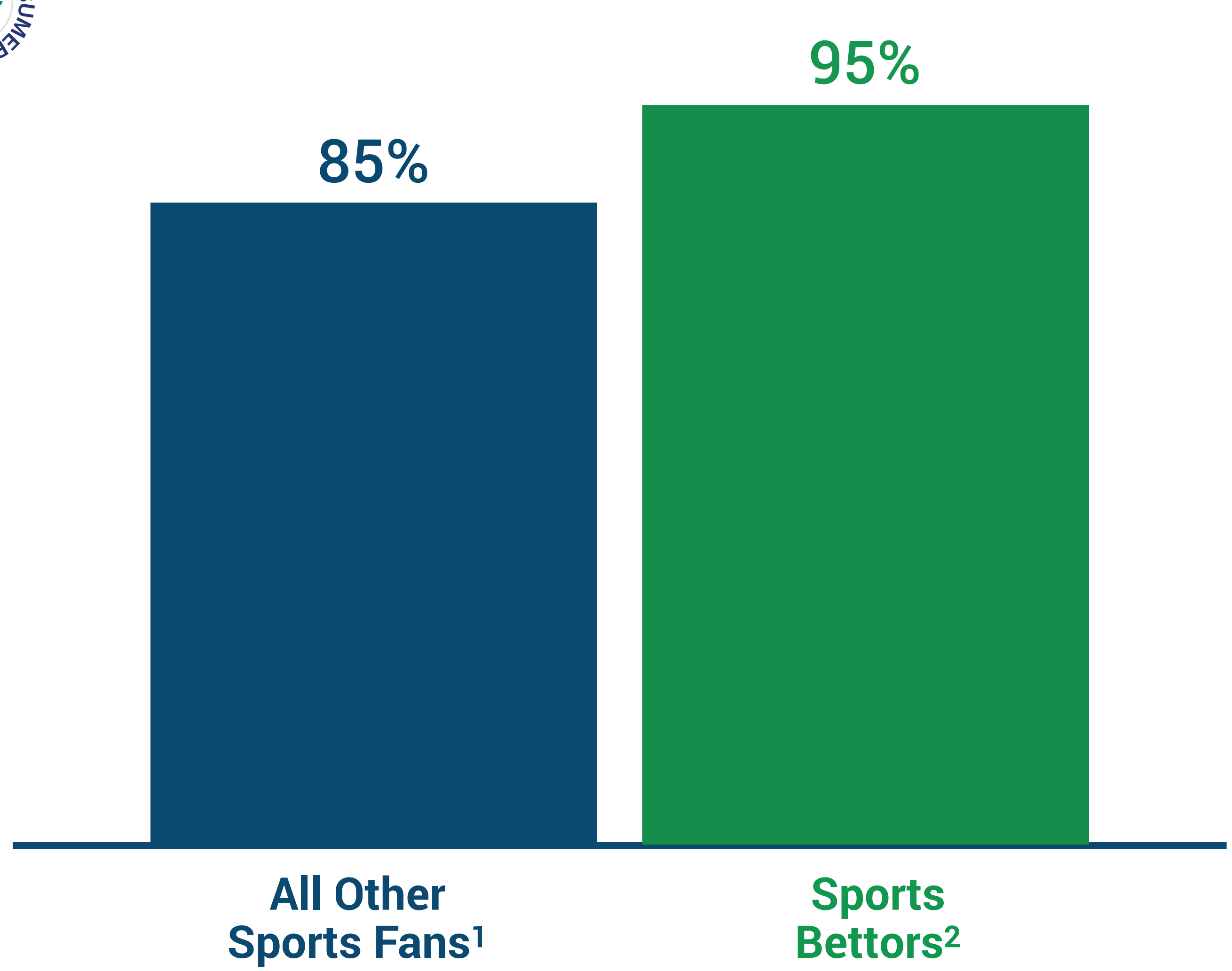
NUMBER OF SPORTS FOLLOWED, U.S., 2020, AVERAGE NUMBER OF SPORTS

The average Sports Bettor follows one more sport than the average non-bettor



LIVE SPORTS VIEWERSHIP[3] BY FAN TYPE, U.S., 2020, % SPORTS FANS[2] AGED 18+

ACTIVATE CONSUMER INSIGHT



1. "Sports Fans" are defined as followers (e.g. those attending live events in person, watching games or highlights, reading articles or statistics) of at least one sport in the last 12 months. 2. "Sports Bettors" are defined as Sports Fans who have placed a bet on at least one sport in the last 12 months. 3. "Live Sports Viewership" indicates Sports Fans who have watched a live sports event on any video media format or in person in the last 12 months.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

Partnerships between sports betting operators, leagues, and media companies will create new sports betting experiences

PARTNERSHIPS WITH SPORTS BETTING OPERATORS ESTABLISHED OVER THE LAST 12 MONTHS

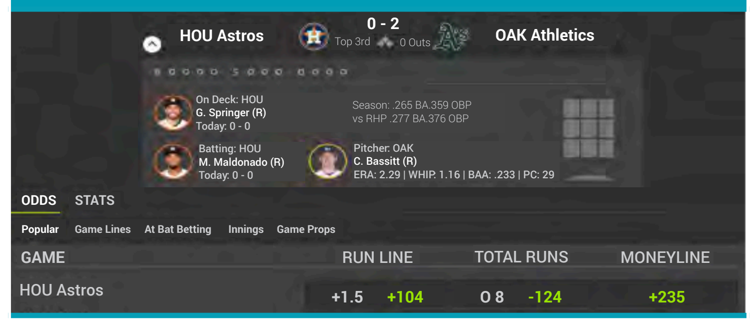
MEDIA COMPANIES

are integrating betting data from major operators to enhance sports programming across linear and digital properties

ESPN	DraftKings
NBC Sports	PointsBet
CBS Sports	William Hill
Fox Sports	Fox Bet
Turner (Bleacher Report, TNT, tbs)	FanDuel, DraftKings
Sinclair Broadcast Group	Bally

SPORTS LEAGUES

are partnering with betting operators to share exclusive content and data insights to provide new experiences to engage fans



PGA Tour, Major League Baseball	DraftKings
PGA Tour, NBA	PointsBet
NBA	William Hill
Major League Baseball	Fox Bet
NHL	FanDuel

SPORTS TEAMS

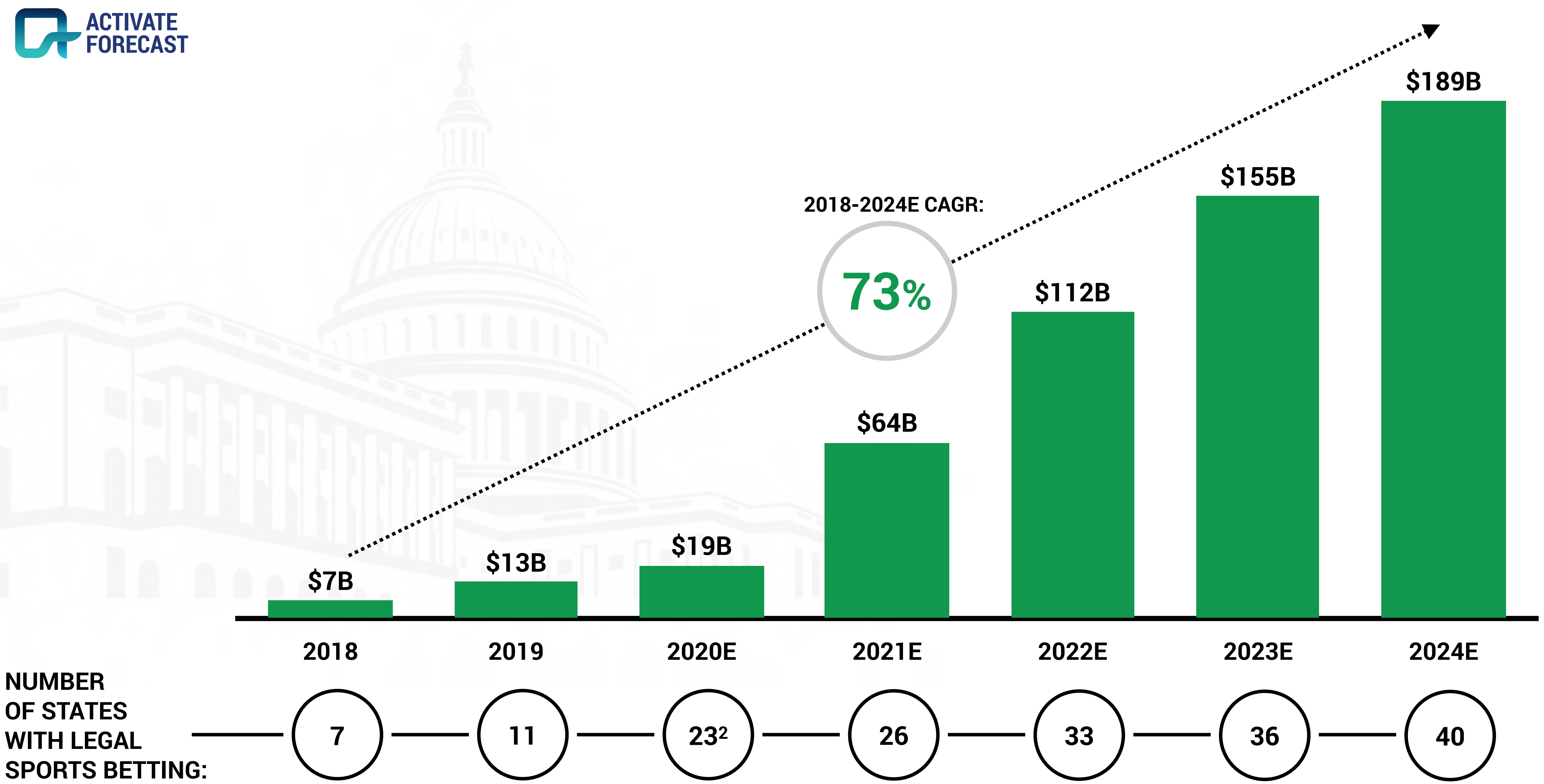
are working with betting operators to create unique, team-specific fan experiences both in-venue and out-of-venue

Rockies, New York Rangers, Eagles, Knicks, Pacers, Celtics, NY Giants, 76ers, Chicago Cubs	DraftKings
Detroit Tigers, Indianapolis Colts, Colorado Avalanche, Chicago Bears, Denver Nuggets	PointsBet
Washington Wizards, Washington Capitals, Mystics	William Hill
Philadelphia Eagles, Philadelphia 76ers	Fox Bet
Broncos	FanDuel

Sources: Activate analysis, Company press releases, PRNewswire

Driven by strong legislative tailwinds, we forecast that the total sports betting amount wagered will reach $189B by 2024

TOTAL SPORTS BETTING AMOUNT WAGERED[1], U.S., 2018-2024E, BILLIONS USD

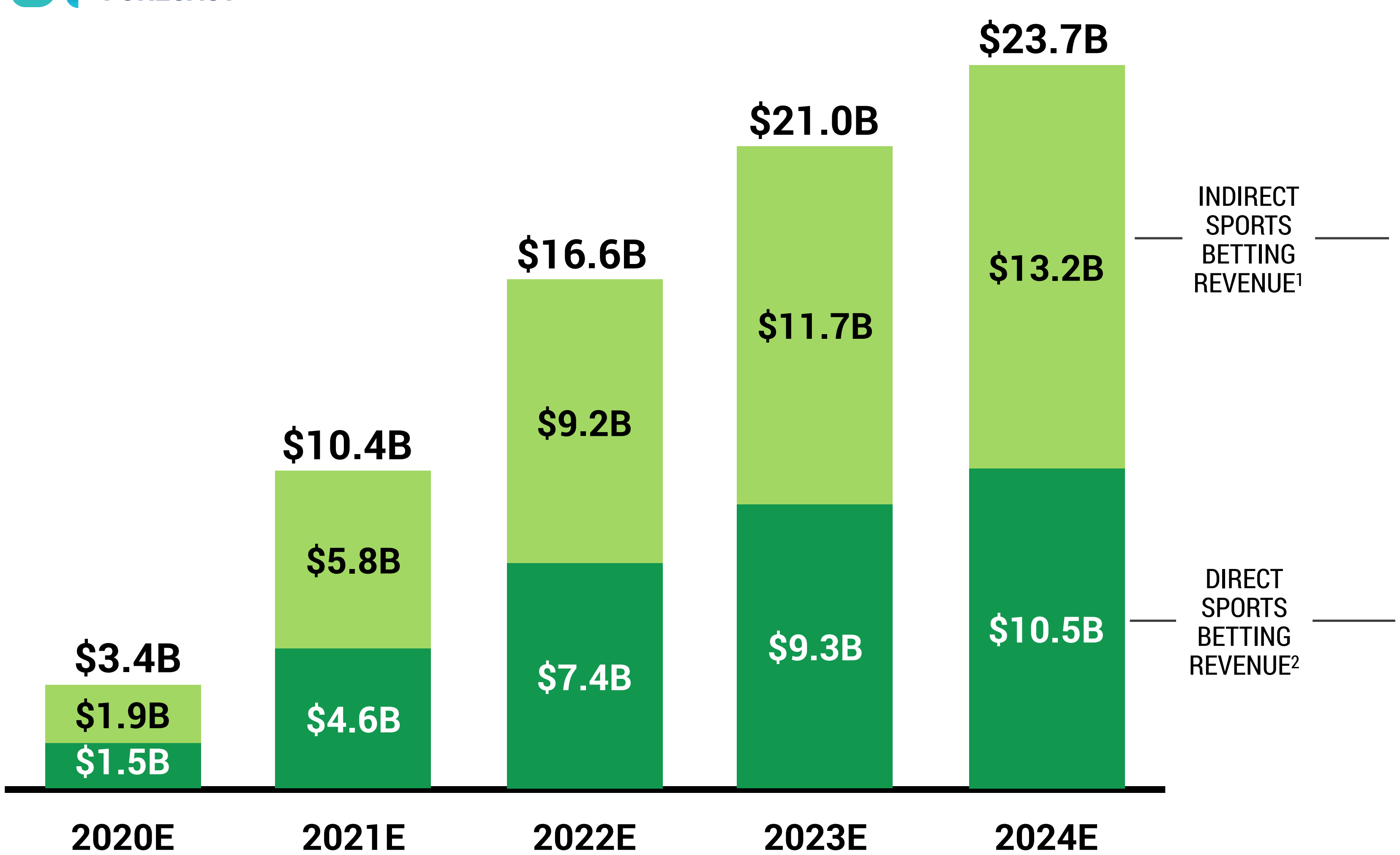


1. Projection assumes 40 states will legalize sports betting by 2024. The U.S. betting economy consists of the cumulative GDP in states that have legalized sports betting. 2. In 2020, sports betting is legal in 22 states and Washington D.C.
Sources: Activate analysis, Action Network, Bureau of Economic Analysis, Legal Sports Report, Nevada Gaming Control Board

Sports betting will result in roughly $24B in revenues for technology and media companies by 2024

SPORTS BETTING REVENUE BY TYPE, U.S., 2020E-2024E, BILLIONS USD

ACTIVATE FORECAST



INDIRECT SPORTS BETTING REVENUE

LEAGUES/TEAMS

TRADITIONAL TECH COMPANIES

SPORTS TECH COMPANIES

MEDIA COMPANIES

VENUES

DIRECT SPORTS BETTING REVENUE

SPORTSBOOKS

CASINOS

STATES[3]

1. "Indirect sports betting revenue" is determined as a ratio of direct sports betting revenue comprised of media rights, advertising, sponsorships, and data rights. 2. "Direct sports betting revenue" is determined as a share of the total amount wagered and depends on odds, type of wager, and individual sportsbooks. The betting provider's take rate ranges from 4-36% of total amount wagered. 3. State tax income is generated as a share of the total amount wagered, a share of gross gaming revenue (ranges from 7-51% depending on the state and type of betting), and by gaming licensing fees.
Sources: Activate analysis, Bureau of Economic Analysis, Eilers & Krejcik Gaming, Legal Sports Report, The Lines, Nevada Gaming Control Board

CONTENTS

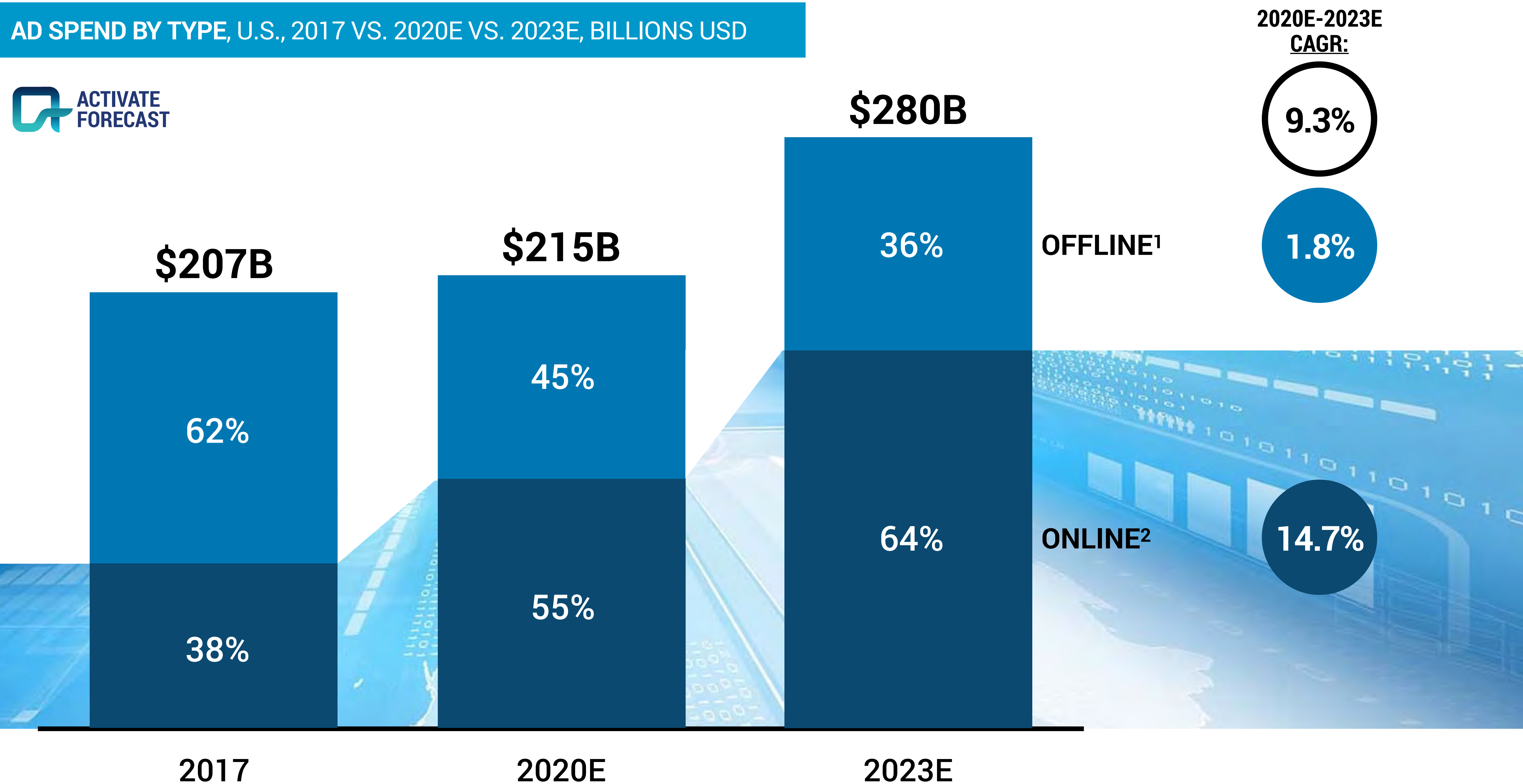
activate consulting
www.activate.com

Digital identity is the currency for internet advertising; the elimination of third-party cookies by the end of 2021 will fundamentally reshape the industry

- **Today, the main source of identity on the open web is third-party cookies, enabling personalized advertising and user tracking across domains and devices**
- **By the end of 2021, it is highly likely that third-party cookies and cross-device identifiers will be eliminated**
- **This gives the major walled gardens (e.g. Facebook, Google, Amazon) the advantage in personalizing advertising and tying user behavior on their platforms to interest and intent**
- **Faced with this challenge, internet companies and marketers will need to create new identifiers that bridge the identity and personalization gap**
- **Going forward, we will see the formation of "private gardens," capable of reaching users without going through the walled gardens, and major efforts by marketers to build robust first-party data capabilities**

Over the next 3 years, U.S. internet digital advertising spend will become almost two thirds of all advertising spend in the U.S.

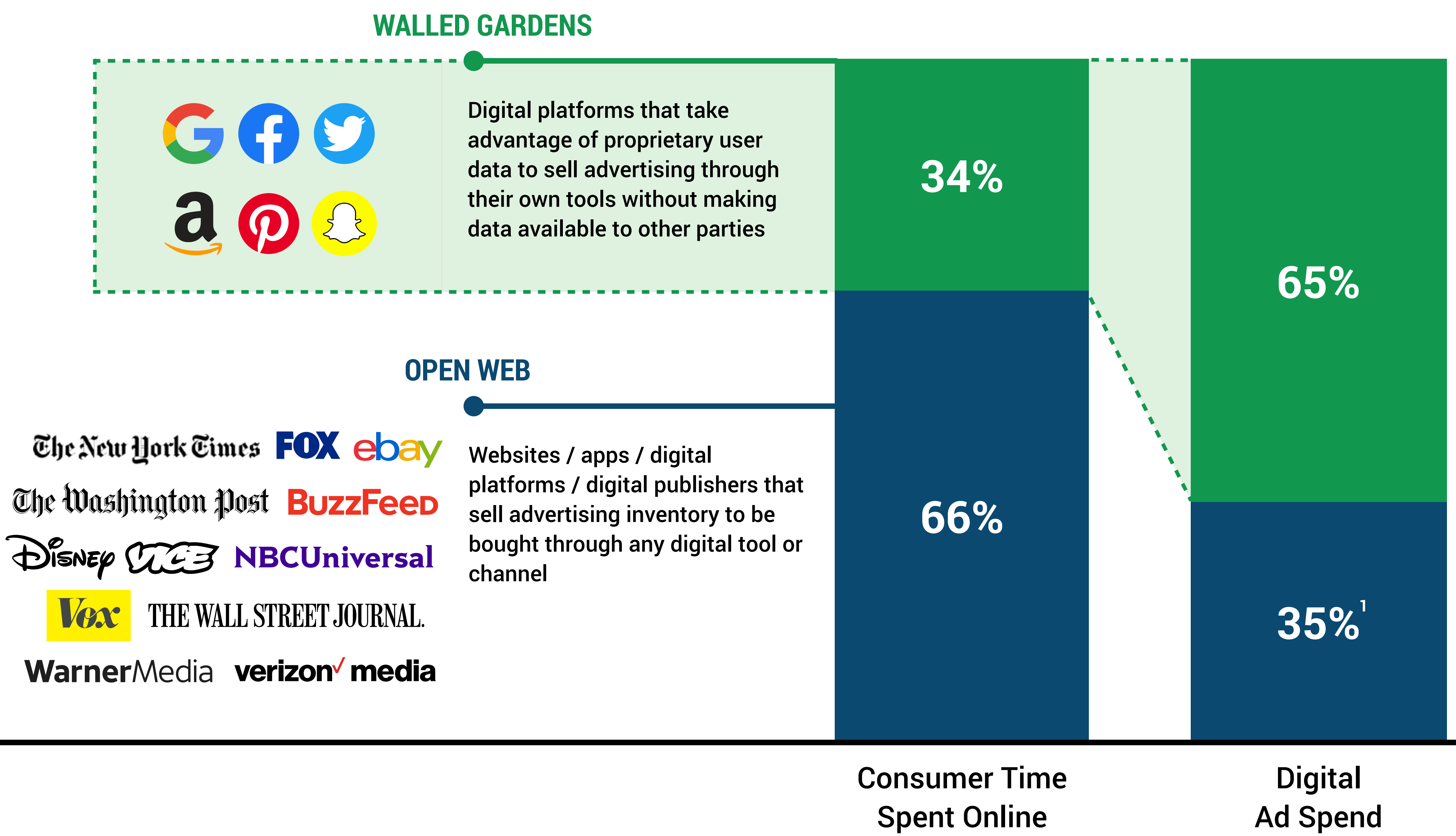
AD SPEND BY TYPE, U.S., 2017 VS. 2020E VS. 2023E, BILLIONS USD



1. "Offline" includes TV, radio, print, direct mail, out-of-home, and other non-digital media.
2. "Online" includes search, social, display, video, apps, audio streaming, and other digital media.
Sources: Activate analysis, eMarketer, GroupM, Magna, MoffettNathanson, Morgan Stanley, ZenithOptimedia Group

Walled gardens capture a disproportionate share of advertising relative to their share of consumer internet time; this is driven by their control of users' data and their ability to use that data to target and personalize advertising

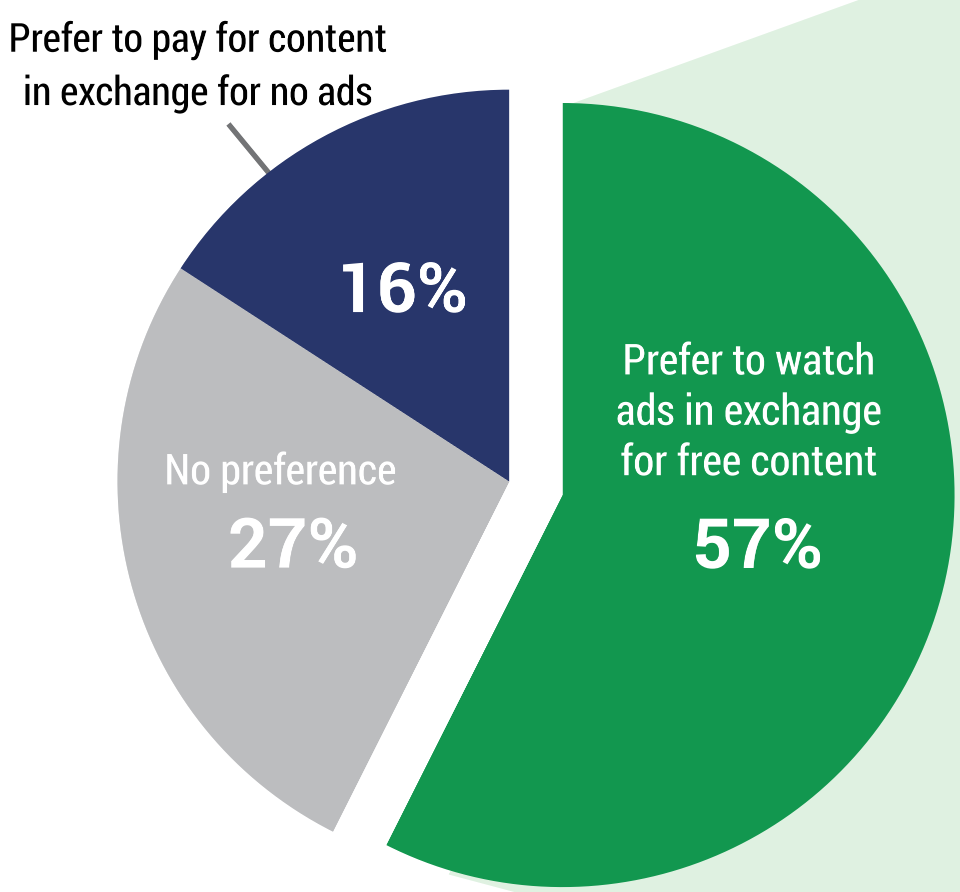
CONSUMER TIME SPENT ONLINE VS. DIGITAL AD SPEND BY TYPE, U.S., 2020E, % TOTAL TIME ONLINE / % TOTAL DIGITAL AD SPEND



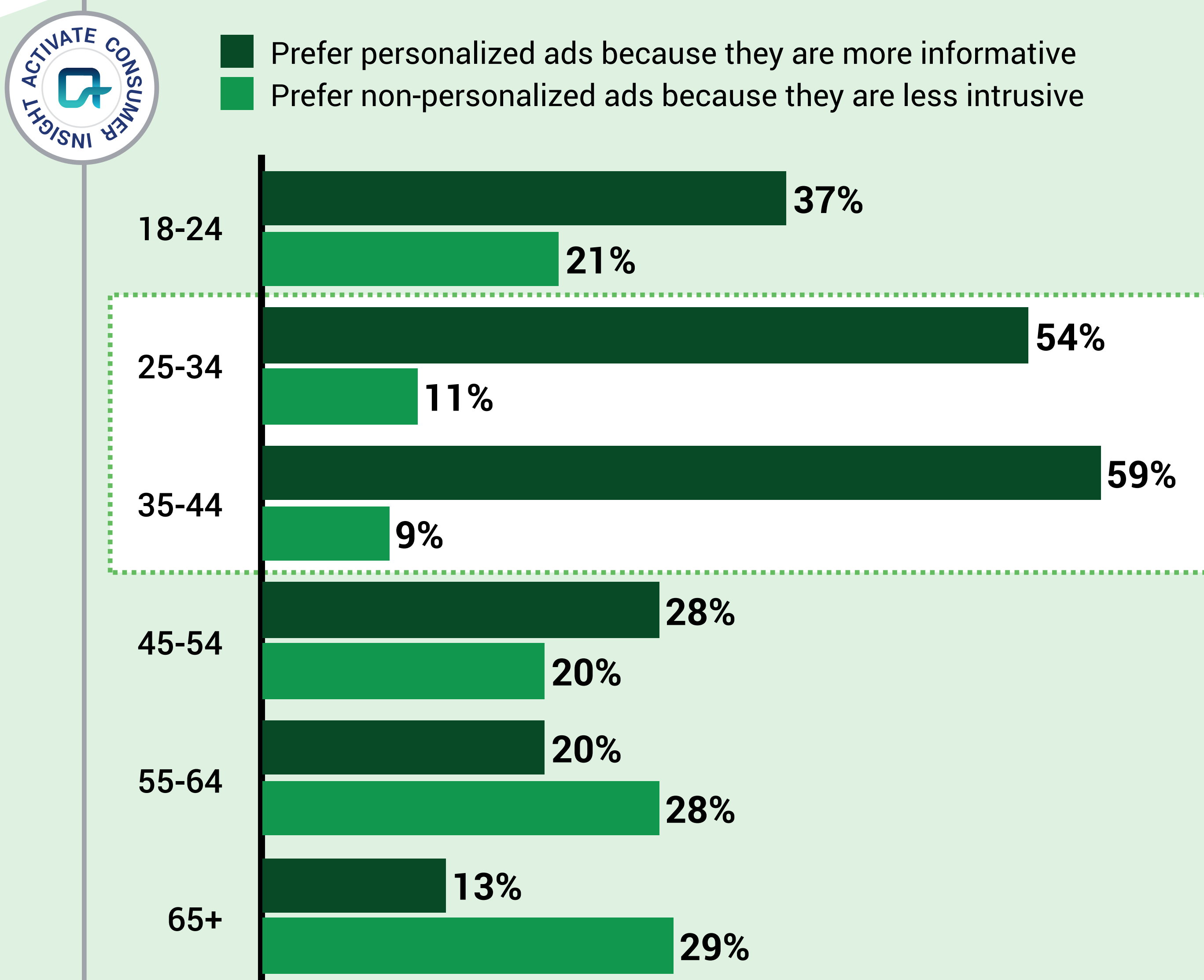
1. Open Web ad spend of 35% includes 10% of total digital ad spend that is allocated through walled garden tools (e.g. Google Display & Video 360).
Sources: Activate analysis, Forrester, Jounce Media, LUMA Partners, OpenX Harris Poll (n = 2,000)

Personalization – enabled by extensive user data – will be critical to the growth of internet advertising

CONSUMER PREFERENCE FOR ADS IN EXCHANGE FOR FREE CONTENT, U.S., 2020, % ADULTS AGED 18+ WHO DO NOT USE AD BLOCKERS



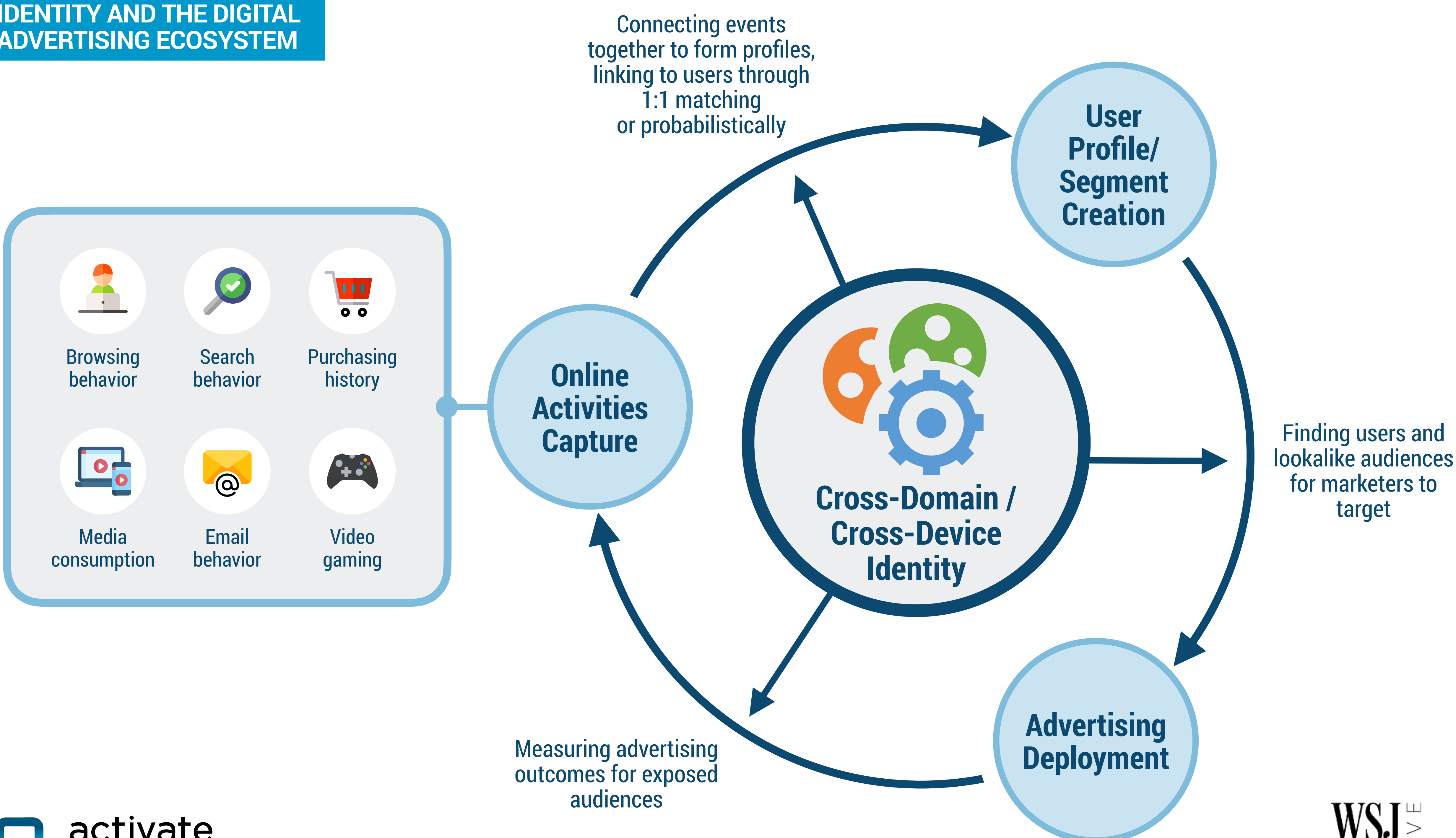
PREFERENCE FOR PERSONALIZED ADVERTISING BY AGE GROUP[1], U.S., 2020, % ADULTS AGED 18+ WHO PREFER TO WATCH ADS IN EXCHANGE FOR FREE CONTENT



1. Excludes consumers who use an ad blocker, as well as consumers who answered that they have no preference between personalized and non-personalized ads.
Sources: Activate analysis, Activate 2020 Consumer Tech & Media Research Study (n = 4,003)

For technology companies and advertisers, cross-domain cross-device identity is critical for personalization and targeting

IDENTITY AND THE DIGITAL ADVERTISING ECOSYSTEM



Source: Activate analysis

The biggest disruption across the internet is going to be the elimination of cookies in 2022, crippling the ability for advertisers and technology companies to identify users as they travel across the web

MAJOR THREATS TO THE DIGITAL ADVERTISING ECOSYSTEM

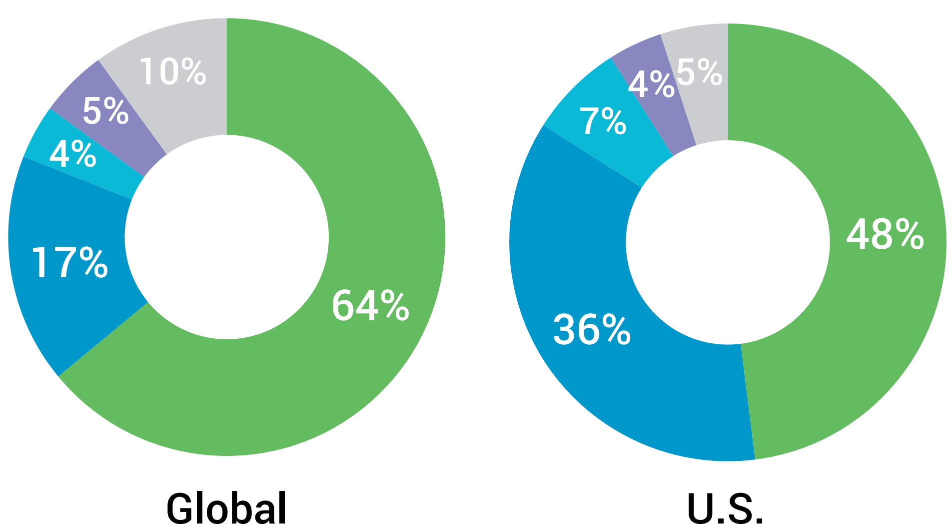
IDENTITY ROADBLOCKS	PLAYERS[1]	DESCRIPTION	TIMING	IMPLICATION FOR: CONSUMER	IMPLICATION FOR: ADVERTISER	IMPLICATION FOR: PUBLISHER
DATA PRIVACY	EU, Governments	Regulation of data collection and usage requiring user consent (e.g. GDPR[3], CCPA[4])	Ongoing	Ability to choose more data privacy and disable data sharing with third parties	Loss of consumer data	Loss of consumer data
ANTITRUST		Investigations into anticompetitive practices by major tech platforms in several areas, including digital advertising (e.g. Google, Apple)	Ongoing		Pending outcome of ongoing investigations and legislative efforts	
THIRD-PARTY COOKIE ELIMINATION	Google	Third-party cookies being eliminated on Chrome browser (which accounts for the majority of internet browser usage)	Takes effect in 2022		Reduction in advertising personalization in the near term	Lower ad inventory value especially for smaller publishers
DEVICE IDS UNDER THREAT (IDFA[2])		Apple planning then delaying restrictions on IDFA[2] in iOS 14 (released 2020)	Postponed to 2021		Inability to track personalization and effectiveness of ad campaigns in mobile apps	Lower ad inventory value through reduced effectiveness of app download and retargeting capabilities
NEW "PRIVATE GARDENS"	Disney, Microsoft, Walmart	Smaller "private gardens" using their first-party data and building capabilities for advertisers on their platforms	Ongoing		Ability to replicate walled gardens' personalization and attribution in smaller and/or specialized platforms	Improved value proposition for advertisers through emulating what walled gardens offer

activate consulting

1. Not exhaustive. 2. "IDFA" refers to the Identifier For Advertisers, the Apple iOS identifier used for mobile devices. 3. "GDPR" refers to the European Union's General Data Protection Regulation. 4. "CCPA" refers to the California Consumer Privacy Act.
Sources: Activate analysis, Company sites, Government sites

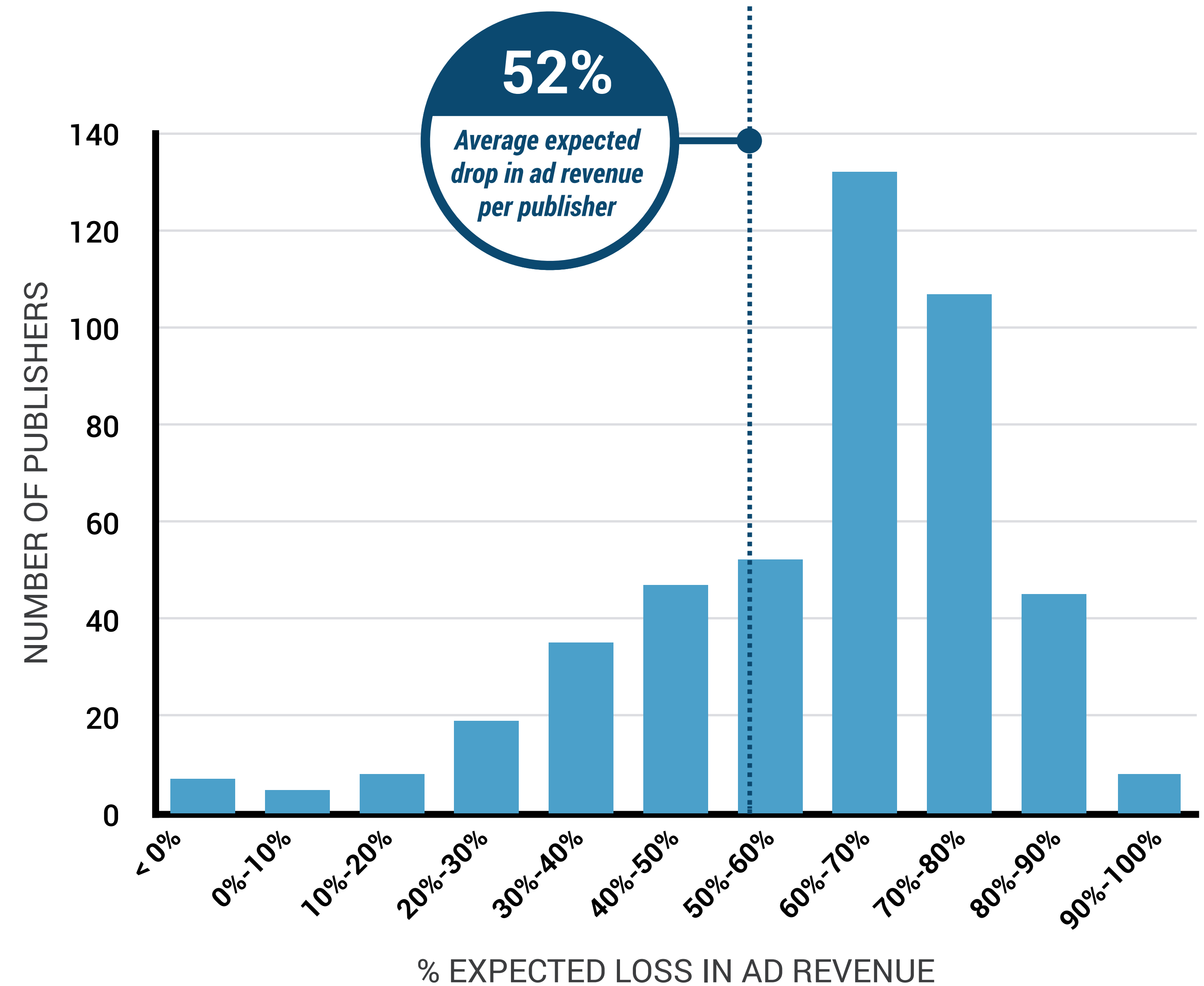
The end of cookies will significantly impact publisher revenues as targeting will lead to less effective advertising – different identifiers and alternatives need to be established to make up for the gap

MARKET SHARE OF MAJOR WEB BROWSERS[1], GLOBAL VS. U.S., 2020E, % WEB BROWSER MARKET BY USAGE



	Third-party cookie elimination status:
Chrome	*Scheduled for 2022*
Safari	*In effect*
Edge	*In effect*
Firefox	*In effect*
Other	

REVENUE IMPACT TO TOP 500 PUBLISHERS FROM DISABLING THIRD-PARTY COOKIES, GLOBAL, 2019, % ADVERTISING REVENUE / NUMBER OF PUBLISHERS



1. Includes browsers on all platforms (e.g. desktop, mobile, tablet)
Sources: Activate analysis, Company sites, Google, Statcounter

As privacy regulation is heightened, user consent will become a requirement for all identifiers passively collecting data in the background — either by government or ad-tech players

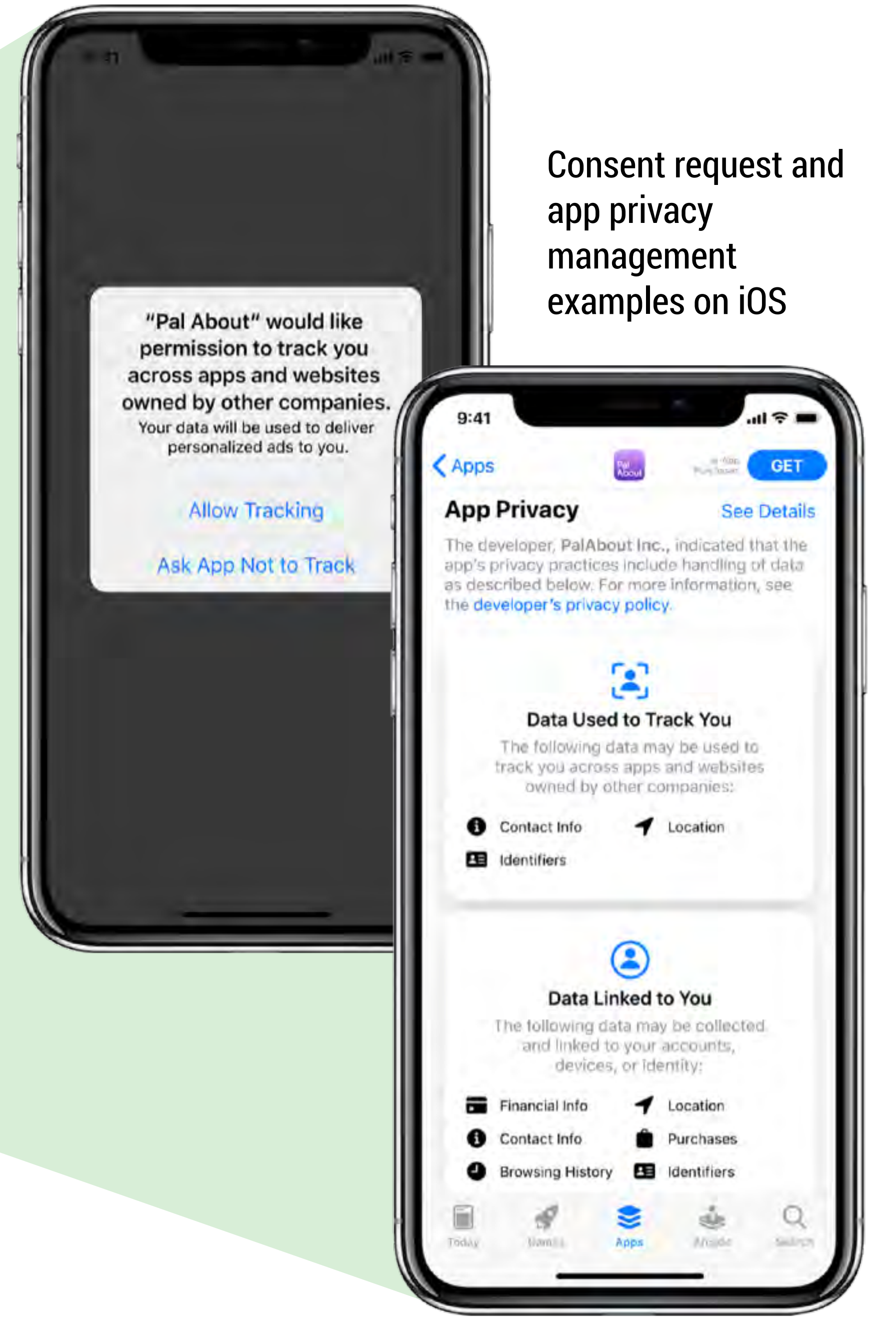
MAJOR CURRENT IDENTIFIERS

WEB	First-Party Cookie Third-Party Cookie
PERSONAL INFORMATION	Name Email Phone Address
ANONYMIZED PERSONAL INFORMATION	Credit cards Loyalty cards
LOCATION	IP address
PERSONAL ELECTRONIC DEVICES	Mobile Device ID (IDFA[2], GAID[3], MAID[4]) Device Fingerprinting
INTERNET OF THINGS	Smart TV Smart Appliances (e.g. Smart Fridge) Smart Car ID

USER CONSENT[1]

Identifiers and personal data collection methods will need to **evolve to obtain <u>active user consent</u>** to mitigate consumer concerns and abide by privacy regulations

Consumers should be **incentivized to consent and authenticate** in the future, or else personalization across the open web will be a challenge



Consent request and app privacy management examples on iOS

1. User consent is currently collected actively (users opt-in / users volunteer data) and passively (collection happening in the background) for different identifiers. 2. "IDFA" refers to the Identifier For Advertisers, the Apple iOS identifier used for mobile devices. 3. "GAID" refers to the Google Advertising ID, the Android identifier used for mobile devices. 4. "MAID" refers to the Mobile Advertising ID.
Sources: Activate analysis, Beeswax, Company sites, Didomi

"Private gardens" will sprout in every industry where players capture abundant first-party data

POTENTIAL "PRIVATE GARDENS"

PLATFORM TYPE	PLATFORM ADVANTAGES	POTENTIAL CONTENDERS
TECHNOLOGY	Scaled data on user activity across various technology platforms	Microsoft, Roku
TELECOM	Scaled data on user location and data consumption	AT&T, Comcast, Spectrum, T-Mobile, Verizon
MEDIA	Scaled user data buoyed by the increasing requirement for authentication	NBCUniversal, Netflix, Disney, Fox, ViacomCBS
RETAIL	Scaled user and purchasing data driven by increasing eCommerce penetration and loyalty programs driving the ability to connect online and offline behavior	Walmart, Kroger, Costco Wholesale
DIGITAL MARKETPLACES	Scaled user data with location and consumption behavior relevant to many industries (e.g. Food & Beverage, Consumer Packaged Goods, Transport/Mobility)	Uber, Lyft, DoorDash, eBay, Grubhub
PUBLISHING	Scaled user data driven by the increasing shift to paywalls and authentication requirements	The New York Times, BuzzFeed, Fox News, The Washington Post, The Wall Street Journal
LOYALTY PROGRAM / INTEREST GROUPS	Scaled user data that cuts across many industries with significant offline audience engagement	AARP, AAA, USAA
WALLED GARDEN	Scaled, highly engaged audiences across the dominant platforms with insight into high intent, extremely granular, actionable user data	Google, facebook, amazon

With the elimination of third-party cookies, the ecosystem players will need to leverage a combination of deterministic and probabilistic targeting techniques to reach a wide consumer base across the internet

DETERMINISTIC TARGETING[1] ⟷ PROBABILISTIC TARGETING[2]

LIKELY ELEMENTS OF THE FUTURE OF TARGETED ADVERTISING

TARGETING SOLUTIONS	TARGETING BASED ON FIRST-PARTY DATA	COHORT-BASED TARGETING[3] (STARTING 2022)	CONTEXTUAL TARGETING
DESCRIPTION	Consumers are identified on a 1:1 basis via first-party cookies, but only on publisher sites where they authenticate	Consumers are anonymously grouped into cohorts by browser or an independent ad server	Consumers are not identified and advertising is delivered based on context and publisher affinity

THE NEW DIGITAL ADVERTISING PARADIGM

ADVERTISERS

- Incentivize consumer authentication and collect more first-party data
- Connect first-party data with that of publishers and ad-tech players to target and convert consumers effectively

PUBLISHERS

- Increase the value of advertising inventory through:
  - More first-party data via authentication
  - Adding contextual cues (e.g. keywords, topics) on websites

AD-TECH

- Offer a combination of available targeting solutions
- Capture new identifiers and partner with data providers to enrich user graph
- Find compliant ways to enable cross-domain / cross-device identification (e.g. clean rooms)

1. "Deterministic targeting" is defined as targeting that uses data to identify a consumer via a 1:1 match. 2. "Probabilistic targeting" is defined as targeting that uses modeled data to identify an individual with a high probability of being a particular consumer / part of a consumer cohort. 3. The future paradigm of cohort-based targeting on Google Chrome is still being decided (e.g. Dovekey Privacy Sandbox proposal).
Source: Activate analysis

Digital identity is one of the most important issues facing major marketers, and will be a C-suite and board-level issue in 2021…

- The cookie-less future is fast approaching and will radically impact the overall effectiveness of digital advertising and put current business models at risk
- Marketers need to take action now to prepare for changes in consumer tracking technology and privacy regulations to enable customer acquisition, sales, brand-building, and marketing performance
- The solutions will include new identifiers based on a value trade with users: providing a reason for consumers to share their information in return for a more personalized experience and a superior value proposition
- Technology and media companies, as well as marketers, will need to determine how they can build extensive first-party data based on that value trade, and create or work with “private gardens” to counter the walled gardens

…Every major marketer will need an identity strategy to ensure the continued growth of their business

Source: Activate analysis

The Activate team thanks our data partners

ACTIVATE DATA PARTNERS

nielsen

comscore

tubular

APP ANNIE

CREATED BY THE ACTIVATE CONSULTING TEAM:

Michael J. Wolf
Seref Turkmenoglu
Samuel Studnia
Edward Doueihi
Joe Simon
Donovan Rose
Mitch Gainer
David Howard
Ellis Bowen
Allison Flanders Brito
Cigdem Binal
Brian Flaxman
Marlee Melendy
Mark Manley
Zachary Remsen
Kyle Kroeger
Lily Silva
Kyler Meehan
Tyler Davis
Karinya Ghiara
Phoebe Gould
Joe Sileo
James Goldberg
Sonali Dane
Brigid Lynch
Caleb O'Brien
Cory Goldenthal
Laura Miller
Annik Wolf
Frank Noto
Denise Shea
Stephen Corsello

Activate Technology & Media Outlook 2021

activate consulting
www.activate.com