VR

Technology Setups for Events

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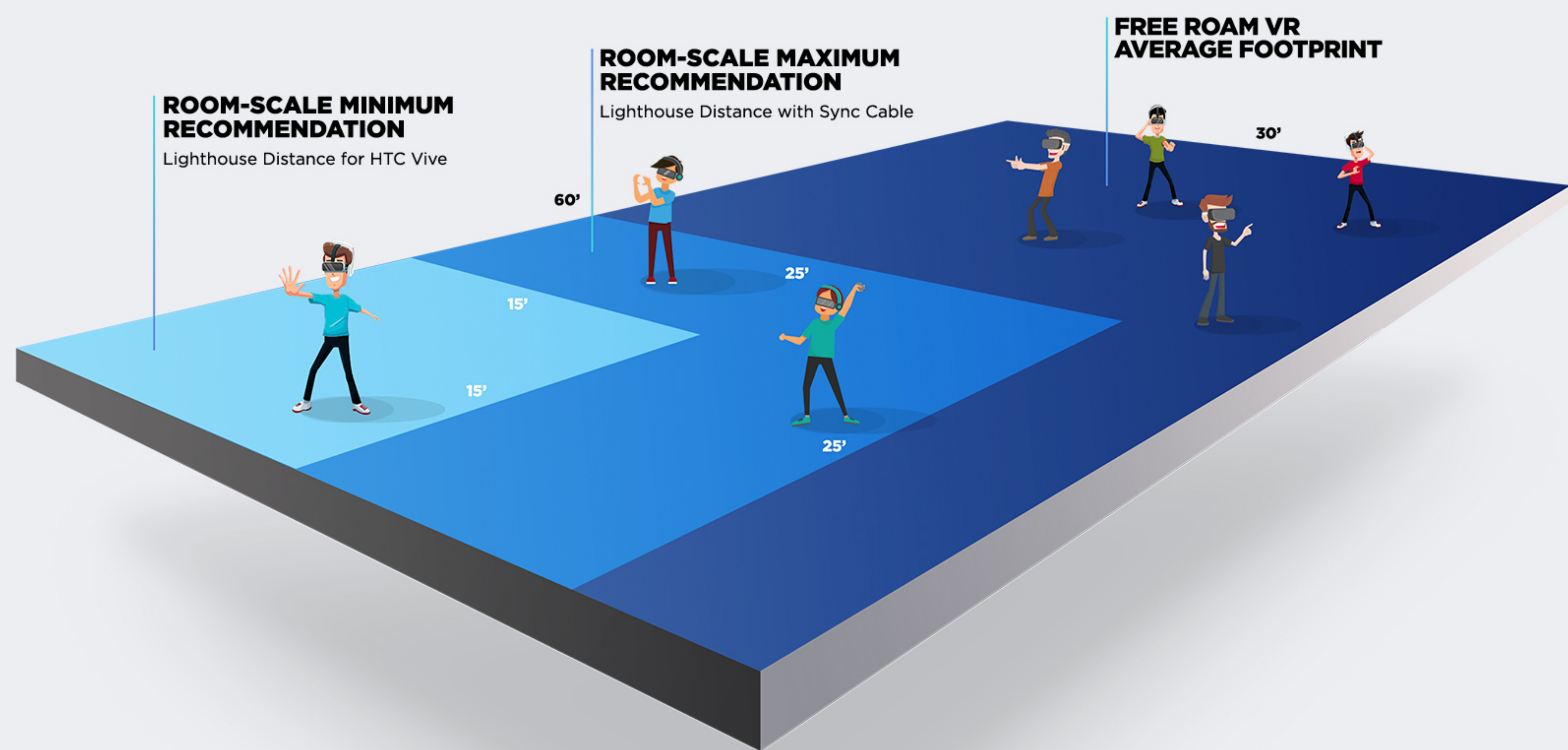
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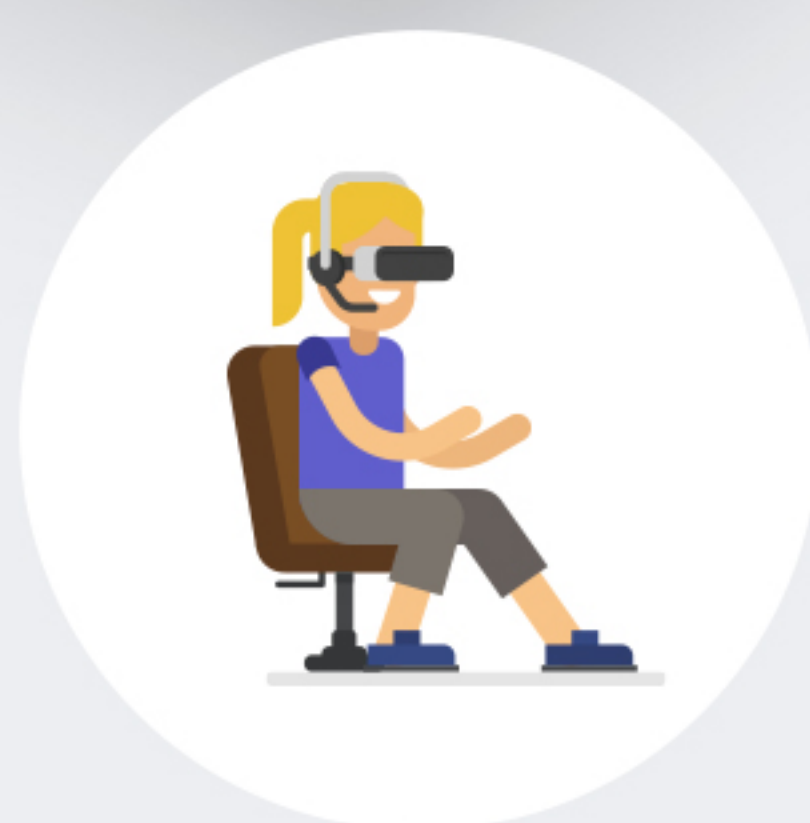
VR/AR ASSOCIATION
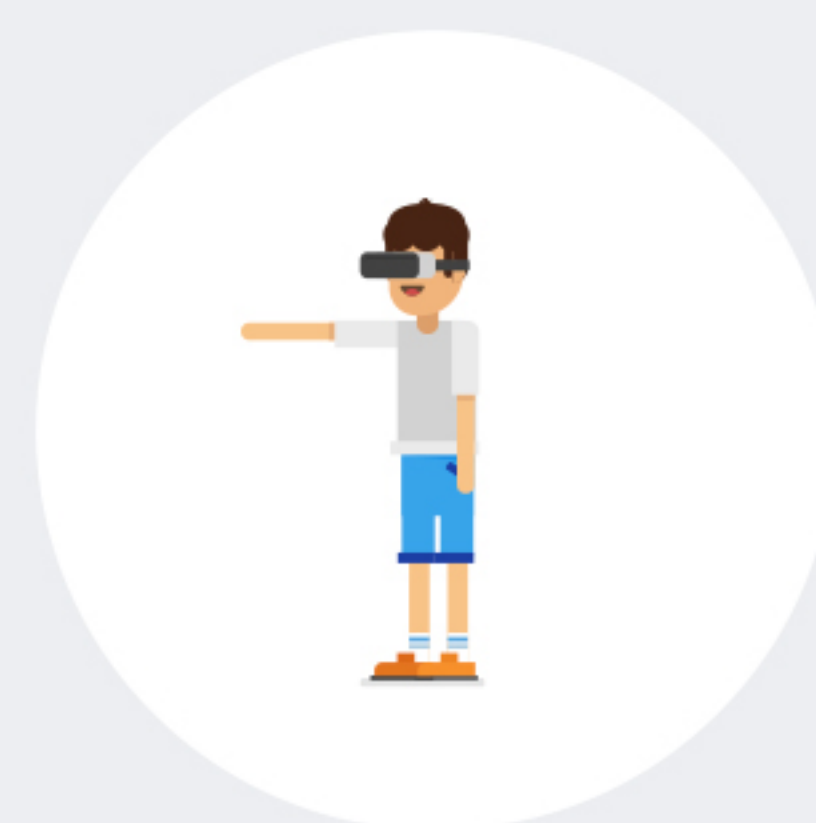
VR Setups for Events, Tradeshows, and Large Public Areas

ROOM-SCALE MINIMUM RECOMMENDATION
Lighthouse Distance for HTC Vive

ROOM-SCALE MAXIMUM RECOMMENDATION
Lighthouse Distance with Sync Cable

FREE ROAM VR AVERAGE FOOTPRINT

15'
15'
60'
25'
25'
30'

All-in-one

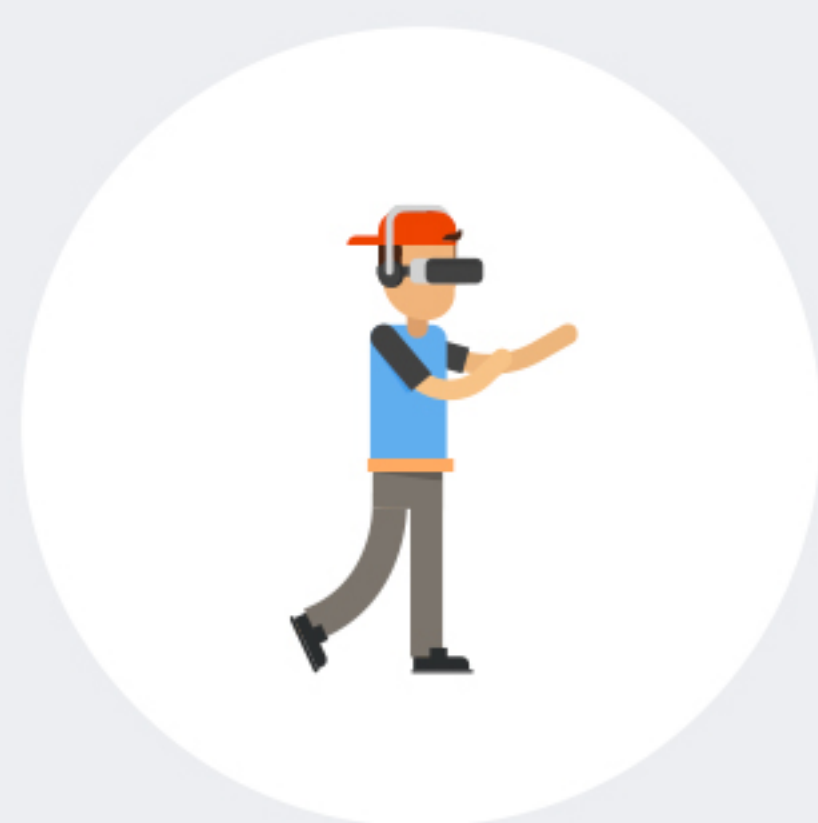3 Degrees of Freedom
Rotational 360°

Positional

6DoF, Seated
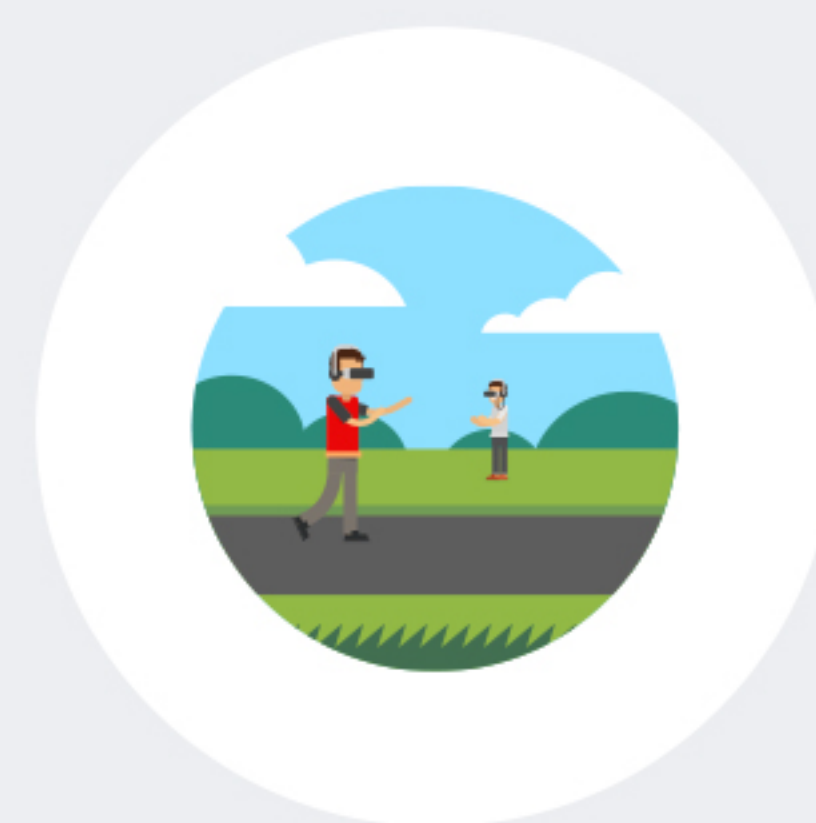
Positional

6DoF, Standing

Room-scale

6DoF, Walking,
up to ~25' - 25'

Free Roam

Untethered Warehouse scale
Outside-in device tracking
min. 30' - 60'

Worldscale

Inside-out standalone
tracking
min. 6' - 6'

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Different types of VR experiences... the benefits, tradeoffs, and considerations

360° Video

Benefits:

Simple start to finish experience with a set duration. Minimal setup, assistance and performance requirements; also possibly easier creation workflow.

Tradeoffs:

3DoF is less immersive (only rotates left right, up and down) with no positional tracking so head movement can feel off.

Considerations:

Highly accessible for mass distribution for all mobile/standalone headsets, but also available for desktop PC VR.

Virtual Environments

Benefits:

Enables interactivity & positional tracking for highest quality of **immersion** and less prone to motion sickness.

Tradeoffs:

A high/wide range of production costs. Requires powerful PC and graphics card (min. GPU: GTX 1060 or RX580), additional setup, calibration, and equipment.

Considerations:

Headset cable management, user learning curve (interface, controllers); additional possibilities: photogrammetry & volumeric video.

Free Roam, Untethered

Benefits:

No wires or cables for the user to trip up on that provides complete freedom of movement.

Tradeoffs:

Battery charging times, extra equipment required (vr laptop backpack), complicated setups requiring device tracking (Wifi networks, tracking sensors, or the like).

Considerations:

New standalone headsets with inside-out tracking provide simpler setups for more straightforward use (Vive Focus, Oculus Go, Lenovo Mirage Solo, Pico Neo & Golblin).

Multiplayer

Benefits:

Higher throughput, enables social experiences and multiplayer game mechanics, competitive and cooperative gameplay

Tradeoffs:

Network latency can cause performance lag, larger space requirements

Considerations:

Not a lot of existing multiplayer content

Passive or Interactive

Considerations:

While game engines can enable interactive content that generally increases immersion and realizes other benefits of user agency, more passive experiences can also be designed in game engines with high impact that still take advantage of a relatively linear storytelling approach that can even utilize positional tracking for comfort and exploration (eg. Google Spotlight Stories).

Mixed Reality Capturing

Setting up a mixed reality capture for Virtual Reality doesn't have to be costly, cumbersome, or time-consuming, but will require additional equipment, software and game engine integration. It overlays a real person in the virtual world and broadcasts it to a television, monitor, projection screen, or mobile device for a more entertaining and informative spectator viewing experience.

What you'll need:

Physical Set

A Green Screen:

There are various solutions, including painted walls, rubber floor mats, or fabric/paper hung from the walls.

Lights:

More lighting is always better than less, but no matter how professional the rig, consistency is key. Try to light the subject independently from the background for best results with a green screen

Input Device

Camera(s):

Most wired USB cameras (or HDMI through a capture card) will work for a Mixed Reality Setup.

A Capture Card:

A capture card such as a Razer Ripsaw, Elgato, or Decklink can greatly improve the quality of mixed reality content by enabling the use of high-end HDMI cameras.

Software

Camera Calibration:

Plugins and software such as MixCast and LIV allow for easy mixed reality configuration. Oculus' own toolbox is also an option.

Video Streaming/Compositing software:

Software such as MixCast allow for in-app streaming and recording, but XSplit and OBS are commonly used options as well.

Tips for success:

- Place sensors and lighthouses out of the camera's field of view

- Add a tracker to the camera or configuring multiple cameras (software permitting) to enable more dynamic shots

- Keep the background as flat and consistent as possible for a good chroma key

- If you don't have a green screen or dedicated filming space, there are options that remove any background (MixCast's Static Subtraction), or with depth data from cameras such as the Intel RealSense D435 for green screen-less background removal.

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On the road & need some spare parts? An extra Vive or Oculus? Cables?

Here are some larger chains internationally:

Westcoast Canada
BEST BUY

Eastcoast Canada
BEST BUY | Canada Computers & Electronics

France
fnac

Westcoast US
Fry's ELECTRONICS | BEST BUY

Eastcoast US
BEST BUY

UK
BEST BUY

DACH
Media Markt | SATURN

Spain/Portugal
BEST BUY | Media Markt | PC COMPONENTES.COM | fnac

Middle East / UAE
LuLu

China
Suning 苏宁

Australia
JB HI-FI

Benelux
Media Markt | fnac | Vanden Borre Audio - TV - Multimédia - Electro
ALTERNATE | KREFEL | bol.com

List of Superstores from Wikipedia
https://en.wikipedia.org/wiki/List_of_superstores

Online: Amazon
VR Rentals: thevrara.com/equipment-rentals
or reach out to a Chapter President: thevrara.com/team

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International Shipping Checklist

✓ Highly recommend using a **Customs Broker** to clear shipments and abide by country temporary import rules

✓ Equipment **shipping manifest** including equipment serial numbers, size & weight, country of origin, description

✓ Customs and shipping regulations on certain types of products. For example, **lithium batteries** found in the Vive controllers or VR backpacks are often not allowed in checked luggage and must either be carried on the plane or shipped separately. Shipping companies and import countries may have other limitations on lithium battery products, and quotas for certain origin countries

✓ **Pelican**™ Air cases abide by carry on luggage limits for most airlines to avoid the issue of not allowing lithium batteries in below storage

✓ Proper **declaration** is important to avoid customs problems and potential personal restrictions on future travel.   This can cause serious problems for Nexus, FAST, or similar expedited customs travel programs if equipment is not declared properly
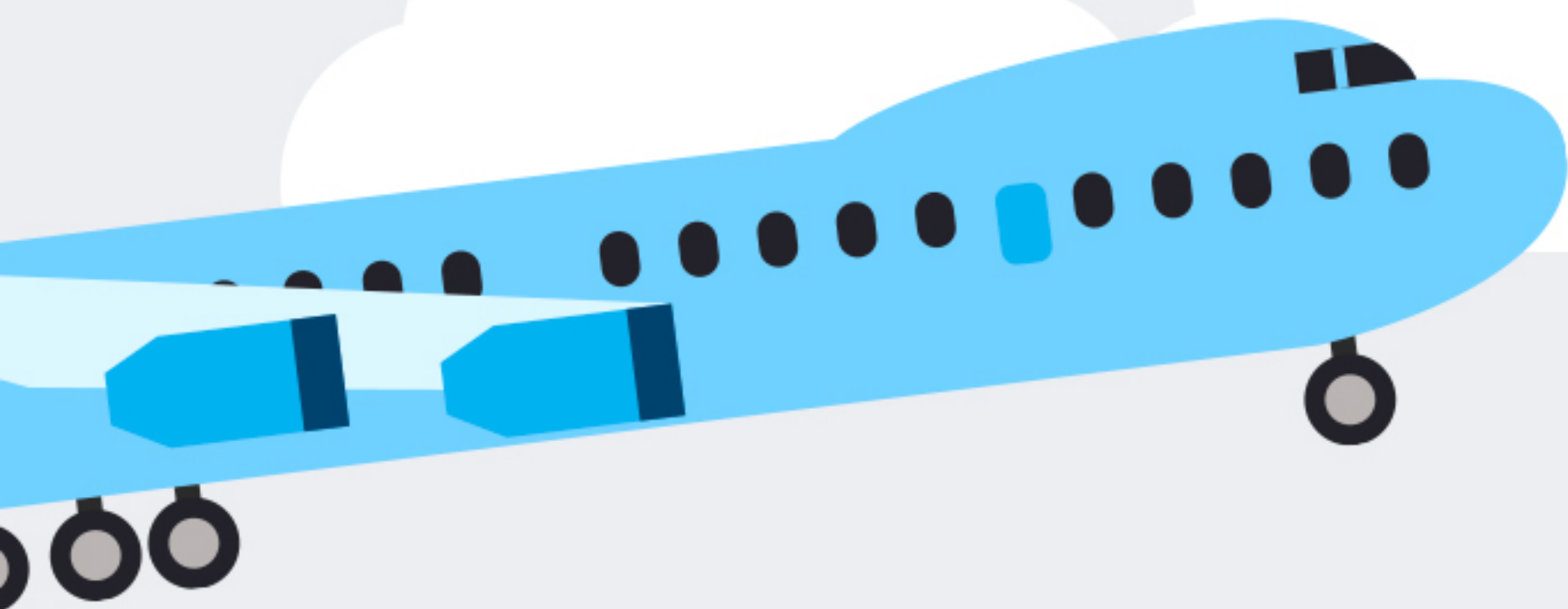
Sanitation Options

Here are some some suggested products to help with the task:

WetOnes Sensitive Skin Wipes

www.wetones.com/sensitiveskin.aspx

WetOnes Anti Bacterial Wipes

www.wetones.com/antibacterial.aspx

Facial Interface & Foam Replacement

www.vrcover.com/shop/

Ninja Masks

www.moguravr.com/nm/en.php

Lens Cleaning Solutions

www.zeiss.com/vision-care/en_de/products-services/other-zeiss-brand-products/lens-cleaning-solutions.html

Headset surfaces, lenses, hand controllers, and other peripherals should always be wiped down after every use. Time and staff must be built into supporting this essential function.

User Experience Considerations for Events

Success Metrics / Social KPIs / Throughput Expectations

Many events judge success by:

- The maximum number of visitors through the experience
- An estimated number of visitors to set expectations
- The number of post-experience social media posts, mentions, hashtags
- The number of post-experience follow up email click-throughs

Throughput calculations:

Length of experience: L_t

Equipment setup and removal time: S_t

Total single person turnaround time: $T_t = L_t + S_t$

Number of stations / simultaneous people in experience: N_p

Number of hours activated per show: H_r

Total Max event throughput: $T_p = T_t * N_p * H_s$

Eg: 3 minute experience (Lt) + 2 minute setup (St) * 4 simultaneous stations (Np) * 24 hours over a 3 day event (Hr) = 5760 Max event Throughput

Equipment Troubleshooting in Public

The biggest issue in **VR Tech Setups** is generally from interference in the environment with each system having its own set of sensitivities. The following is a table of known problems to expect and proposed solutions to avoid them.

Problem	Solution
When multiple installations are in an area are they optically isolated from each other? This can be very hard to control in unplanned environments like trade-shows	Speak to your exhibit neighbours during setup and work out a plan to keep the lighthouses from facing each other.
Wifi interference and crowded networks can have particular impact on untethered setups such as VR backpacks using multiplayer functionality.	Consider high-end wifi systems that automatically manage the wifi channel interference such as the Cisco Meraki line of access points including the MR52.
Theft of mobile and standalone VR headsets is certainly not rampant, but is nevertheless a concern.	It's typically best to staff installations and demos, which solves security, sanitation, and technology issues all at once via a trained CSR.
High-end motion capture equipment such as Opti-Track or Vicon setups have issues with reflective surfaces.	Minimize reflective floor elements with carpeting or gaffer tape.
Lighthouses and Mixed Reality camera rigs are a danger to visitors and are susceptible to vibrations.	Use security barriers to keep people away, hang from the ceiling, or clamp to an autopole.
Some active marker motion capture systems have particularly bad resiliency.	Explore options for frequency hopping settings, minimize distance from LEDs to the radios, and use multiple radios via multiple transmitter cameras.
Oculus Rift cables seem to be a significant vulnerability in the consistent operation causing the computer to lose the headset and pause or crash the experience.	Oculus now sells extra cables and backups should be kept on hand to deal with the inevitable need for replacement on the event floor.

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VR People in the know with experience installing and supporting events:

"Always give yourself fast access to the computers powering the experience. A fast hard reboot tends to solve a large percentage of issues quickly. If your computers are hidden away in enclosures and secured with screws or safety bits, it can take too long to get an experience back up and running. In short remember: Access = Success. Screws = Lose."

- Ben Unsworth, VRARA Co-Chair LBE Committee

"Make sure that you are regularly running software updates on all of your computers. Windows 10, Graphics Card Drivers, your games, and SteamVR in particular. Things move fast in the world of VR with new updates coming out all the time, so make sure you got always up-to-date software for the most reliable customers experience."

- Matthew Hall, CTO at SpringboardVR

"Don't assume there won't be many other lighthouses at the event - you need a plan to minimize interference from others, and to minimize your interference onto others. Using a sync cable and pointing your lighthouses from the front of your booth towards the back wall or interior of your exhibit is good practice. Also be prepared to request the same of your exhibit neighbours."

- Deborah Worrell, Business Development, Escape VR

"Mixed Reality Capturing will have you stand out from the other demos no doubt, but it comes at a cost. On average the buy-in is twice as much in terms of the organisational emailing prior, the actual effort to transport, setup and breakdown on the day, as well as testing and the final budget. Having said that, using green screens to show the person and the Virtual Environment they are in is truly the best way to show-off VR without actually putting a headset on someone."

– Philip Wogart, Co-Founder HEADGEAR

"It is eye-catching to have the latest and greatest technology at your attraction and most clients will ask for it, but this often comes at the expense of something much more important for an installation, its robustness! While state-of-the-art tech will often look very impressive in a demo/lab setup, it will fail miserably when hundreds or thousands of visitors use and abuse it on a daily basis. The key to success is balancing innovation with ease of maintenance, operations and logistics to minimize risk."

– Sergi Sagàs Co-Director, Director of Creative Technologies Mediapro Exhibitions

Created by the VR/AR Association Location Based Entertainment Committee

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