



THE BROAD DIMENSION

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The New Abnormal

When the Covid-19 pandemic struck there was a lot of wishful thinking about being able to get back to normal after sheltering-in-place for a few weeks, or months if things got bad. But summer sunshine didn't magically make the virus go away, and it has seemed to be a constant battle to keep infection numbers down and not overwhelm the healthcare industry. Sometimes it has seemed that every effort at reopening businesses has led to a rapid increase in infection and a sudden reversal of policy. What is and is not officially allowed seems to change daily, and yet overall business activity has got back to almost 80% (at time of writing, early September) of where it was before the pandemic started. That has been due largely to the stimulus packages, which have also pushed federal debt to a level approaching the nation's GDP. Of course, the GDP has been shrinking as the pandemic curtails activity, and Congress has been spending trillions of dollars to keep the economy moving.

Alot of business transactions have moved online, benefitting the likes of Amazon, while many other businesses are finding relatively safe ways to operate during the pandemic.



Change may feel hard, but humans have got to where they are by being adaptable, and adaptability has been needed in volumes recently, and is going to continue to be a requirement for quite a while. Stores may be having to limit the number of customers allowed in at one time, but that has kept vital resources available. Outdoor eating has allowed restaurants to function, at least when the climate allows, beyond just curbside pickup of take-out meals. Making the most of a frustrating situation seems to be the goal until a vaccine is available, and it is getting us better prepared for recurrences of this virus and the potential for future ones. With the human population continuing to rise, it is pushing us more and more into the territory of other creatures, like the bats that are the likely original source of this novel coronavirus (SARS-CoV-2).

Currently, less than two percent of the US population has been infected by SARS-CoV-2, so it still has a lot of people it can mess around with. There are laboratories around the world working on developing a vaccine, but regardless of reports from Russia and China there still hasn't been a vaccine proven to be effective and safe. It would be remarkable if there were, so soon after the discovery of the virus, and a more realistic timeline for having a vaccine available in required quantities is probably mid-2021. Rushing a questionable vaccine out could cause more problems in the short- and long-term than it solves. Questions remain about how much protection a vaccine will give because there are a number of reports of people having been reinfected by the virus. The common cold can result from a different coronavirus and there has never been a vaccine for that and getting infected gives a few months protection, at best, against reinfection.

With these types of concerns, companies and building owners are having to consider how to provide adequate protection for workers when they return to the office and

other premises. Allowing people to continue working from home is an obvious way of keeping staff safely distanced from one another, but that doesn't work for all people or all types of jobs. Consequently, we can expect to see a lot of retrofit/alteration work keeping the construction industry busy as buildings are adapted to provide a healthier environment for staff. We are likely to see more use of demountable partitions and other forms of construction to make buildings more flexible in meeting changing needs.

Online education is proving effective and cheaper for higher education, so it is likely that we will see much of that continuing after the pandemic. That should enable higher education to reach more people, which could well be needed because the jobs that require such education are the ones that tend to be less liable to be replaced by technology. That will probably mean that a lot of university buildings will be repurposed, giving more construction work.



Once the Covid-19 situation has run its course, or settled down to a background issue, it will be time (some will say beyond time) to face the issues of climate change. Some of the solutions we will have adopted coming out of the pandemic should be helping in that regard, but really not doing much more than scratching the surface. At least the Covid-19 situation will have given us a feel for change, because it looks like change is something that we will be living with for a long time, like it or not.

Geoff Canham, Editor, TBD San Francisco

Clearing the Air

We are all being encouraged to wear face masks to prevent the spread of the novel coronavirus, and that is because the virus is known to travel through the air from one person to another. But is there a way of removing the virus from the air inside a building before it can spread too far?

There are three potential ways of getting rid of an airborne virus, namely removing it from the area and disposing of it outside, killing it, and thirdly by filtering it from the air. The first option may sound like it is simply shifting the problem from one location to another, but the virus does not survive long outside of a living host and an outdoor environment is less conducive to it than an indoor one. That is why outdoor dining was allowed at reopening restaurants before indoor dining was, and it is still safer to dine outdoors. However, to ensure that any virus gets removed quickly enough to provide a reasonable measure of protection would normally mean increasing the number of air changes. It is a fact that most of the moisture droplets carrying the virus will fall out of the air within a short distance, hence the six foot 'social distancing', but studies indicate that some smaller droplets can remain airborne for two or three hours, so ventilation systems would provide positive, if limited, protection. One easy way of increasing air changes is to open the windows, if possible.

One of the reasons that the virus is likely to survive for a shorter time outdoors is that it is susceptible to ultraviolet light. HVAC system may already incorporate ultraviolet (UVC) systems in them to kill off any viruses before recirculating the air, so a building owner may just want to check that the ultraviolet light is still working. For new construction and HVAC upgrades, including a requirement for such a system might be advisable because this won't be the last pandemic and killing off viruses is normally a good thing anyway. Some portable air purifiers also incorporate ultraviolet light, but the main benefit from air purifiers is in the filtration they do, and that's what we'll look at next.

HVAC systems and portable air purifiers incorporate filters, but they may be designed more to trap particulate matter



(e.g. dust) rather than viruses. HEPA (high-efficiency particulate air) filters are seen as the best type of filter and are used in airliners to clean the recirculated air, and they are used in laboratories and hospitals. Portable air purifiers frequently use them, and they may be incorporated in your HVAC system. HEPA filters are designed to trap 99.97% of particles that are 0.3 microns in diameter, but the coronavirus is about 0.125 microns in diameter, less than a half of the size of the particles that the filter is specifically rated for. Some of the virus samples have been identified as being as small as 0.06 microns. So, does that mean that HEPA filters are useless for stopping viruses? Not really. The virus is unlikely to be traveling through the air by itself, but in a droplet of water vapor that is likely to be around 0.5 microns in size and would get stopped easily. Plus, the filter is not like a net, where the virus can just find a suitable hole to go through. It is a dense mat of fibers that a free floating virus would have to weave its way through, avoiding fibers constantly, and electrostatic charges on the fibers would be trying to reel the virus in along the way. So, such filters can be very effective, even against viruses.

That said, the air and the viruses in it still has to travel from whoever expelled them to the HVAC vent and on to the filter, and that is likely to be beyond the six foot separation distance recommended for avoiding infection. So, filtering, killing viruses with ultraviolet light, even expelling viruses from buildings are worthwhile processes, especially since Covid-19 will not be the last pandemic to hit planet Earth. However, such technologies should not be considered to be the first line of defense, but one that can help to some degree. For instance, should you be in the unfortunate position of having to care for someone suffering from Covid-19, then having an air purifier close to their bed that could capture at least some of the airborne viruses would be an advantage, but don't let down on any other protective measures. Wearing a mask, social distancing,

washing hands, and disinfecting surfaces that might have been contaminated are all still essential.

With air purifiers and HVAC systems, the faster they can cycle the air, the more effective they will be, but they'll also be noisier. So, getting an air purifier that can handle a larger volume of air and running it at a lower speed may be the way to go.

The filters in an air purifier or in your HVAC system will need to be changed at certain intervals, to prevent them from getting clogged. Take appropriate protective measures at those times too. Any virus that had been captured in the filter is probably long dead, but there's other matter in there that can be noxious, and potentially damaging to your health. For instance, bacteria can survive as spores for millennia, and hopefully the time between filter changes is less than that. When changing a filter, it can be worthwhile checking to see if a higher grade filter is available as the replacement.

Healthy Home Working

One study, before the coronavirus struck, showed that about 4.5% of office workers telecommuted daily, but suddenly everyone was having to do that. Some enjoyed the opportunity, but many longed to get back to the office. A survey by Gensler in May this year showed that only 12% of workers wanted to work from home full-time. By the time it is really safe to get back to the 'old normal', you have to wonder how many more will have gotten used to the convenience of not having to commute, but we can be



certain it won't be all. Many say they miss the interaction with their coworkers, and some just miss the structure of separating work from home, although with emails chasing us everywhere, that separation has become increasingly difficult anyway. And how many of those who said they missed the interaction would have sent a question by email to a colleague two cubicles away, rather than walk around to chat with them?

Anyway, remote working is going to be the norm for a lot of us for a while, and even when (let's not admit that it could be 'if') we have an effective vaccine and we could cram people back into the workspace right alongside each other, we will need to ask if we want to. ENR commented in their International Market Analysis that major design firms were seeing long-term benefits from home working. This writer was taking part in an exercise class via Zoom and one of the participants had had the misfortune of getting trapped abroad by the travel bans. Consequently, she had to join in from a house overlooking the beach in Spain and she showed us the workspace she had set up for her office work, looking out over the ocean. You have to sympathize with these people – or maybe not. If staff can work from home it means that employers can engage the most qualified staff wherever in the world they may be, staff don't have to live in expensive areas where the company may be based, and long commute times can be avoided.

Talking about the elimination of the commute time, that has led to reports of people working longer hours at home than they did in the office. Whether that means that more is being done, or work is getting stretched to fill the saved commute time is unclear, but the lack of that commute means that many people will be missing on the only regular exercise they got during the week. Yes, walking from your parking space to the office does count as exercise, and even pushing the accelerator and brake pedals and turning the steering wheel probably uses more muscles than sitting in front of your computer does. Maintaining a healthy immune system is good practice at any time and in the middle of a pandemic it could be said to be vital, and exercise is one of the most important ways to do that. Getting a good night's sleep is also important for your immune system, and if the alarm clock has been cutting too much off the recommended 7 to 8 hours, then you could use some of that saved commute time to sleep in a bit.

Personal contact also helps boost the immune system, but now it seems that this is going to be largely via Zoom and its ilk, for a while. Software has been enabling remote

conferencing and video chat for many years, but it has become vital in this era of shelter-in-place. There are many options available, and improvements have been forthcoming as heavy usage has highlighted problems and security issues. The actual business software also needs to facilitate remote collaboration more effectively, and these issues are being addressed, or at least they are being raised by users.

You don't need to go to the gym to get sufficient exercise, and right now you probably wouldn't be allowed to do that anyway. The WHO recommends getting out for a fast walk at least 150 minutes a week, which is only 30 minutes a day for a 5-day work week. Plus, getting up to stretch or move about a bit, at least once an hour will offset some of the deleterious effects of constantly sitting. Maybe go and get a glass of water or cup of coffee, and that will ensure that you move again in an hour or so, to go to the restroom. Or better yet, take the dog for a walk to a coffee at a local coffee shop. So, you can schedule a half hour walk for when you would normally be commuting, then on the hour, every hour, get up, stretch and move about a bit. Having a schedule helps build it into your day – turn that little bit of exercise into a habit, and if you can add more exercise later, all the better. Walking has also been shown to be especially good if you are involved in creative activities, boosting creativity by 60% according to one Stanford study. You can even exercise while sitting – just Google 'exercise while sitting' and try out some of the suggestions.

Having a work schedule or routine and a defined 'office' space is also helpful, especially if you need to get motivated. You, hopefully, were in the habit of getting home from the office and relaxing, so now that you're home all the time your body might think it shouldn't be working. The Gensler survey, mentioned earlier, rather surprisingly said that it was the younger generations that were more eager to get back to the office, which may be related to issues such as trying to work from the same computer that they are used to playing video games on. Actually, if you have to get a new computer to work on at home, a gaming machine could be a good choice because they are designed for speed and heavy processing; but you might want to describe it some other way when submitting your expenses claim. Even just having a designated table for your workspace can help move you from a "home and relaxing" frame of mind to a "let's get working" one. That doesn't mean you can't add variety by taking your laptop to work from the sofa or

the outdoor seating at your local coffee shop occasionally. How you fit in the teacher's-assistant role for your kids, we'll leave up to you.

