Toxic Glass and Steel Coffins in Hyper-dense City Centers

How High-tech and Modern City Planning has Failed Us.

by John Henry (June 2020)

One of the ironies of the current pandemic is that modern science or high tech does not have an immediate 'fix' and can only suggest that we stay away from each other in order to manage it until a prophylactic or vaccine is developed. With the CDC updating their original guidance time to time and changing information about the nature of the COVID-19 virus, it is perhaps premature to make general conclusions but, based on the simple facts we have now, I submit the following observations.

The Asian and European populations, during the Black Plague of the 1350s, would finally figure that moving away from the dead and dying outside of the city was the only remedy. Six hundred years later, is this also the best that can be done? Entire metro populations are hiding indoors, afraid to mingle again. They are being ordered to shelter in place, etc.

Basic 'environmental nutrition' is lacking for those living and working indoors for extended periods. They are also subject to transmissible disease the moment they grab a hand bar on public transit to head to work in their downtown death towers. Recent studies show that mechanical air conditioning blows disease dripping particulates throughout any indoor heated or cooled space. We should take notice as it is estimated that we spend nearly 90% of our time indoors.

From the mounting data, we can glean a single irrefutable fact: the farther away people are from each other, the less chance of being infected with a virus. This is true not only for people interacting normally but applies to the way cities are planned and how much density they allow. The latest figures show that less densely populated urban centers and those state economies which are very rural or mostly decentralized are faring much better, in fact, they appear almost immune to the pandemic.

Ancient Rome had about 200 to 300 inhabitants per acre. New York City has an average of 41.25 persons per acre and in Manhattan it is 104 per acre.

The Los Angeles metro area has a population density of one quarter that of NYC or about 10 inhabitants per acre. The rate of infection and total deaths in LA currently is a small fraction of the New York metro area per capita. In fact, California at 40 million has had approximately 3,800 Coronavirus deaths while the state of New York at half the population is reporting approximately 10 times the morbity. Texas also has essentially automobile-centered decentralized cities such as Houston and Dallas with similarly low rates of infection.

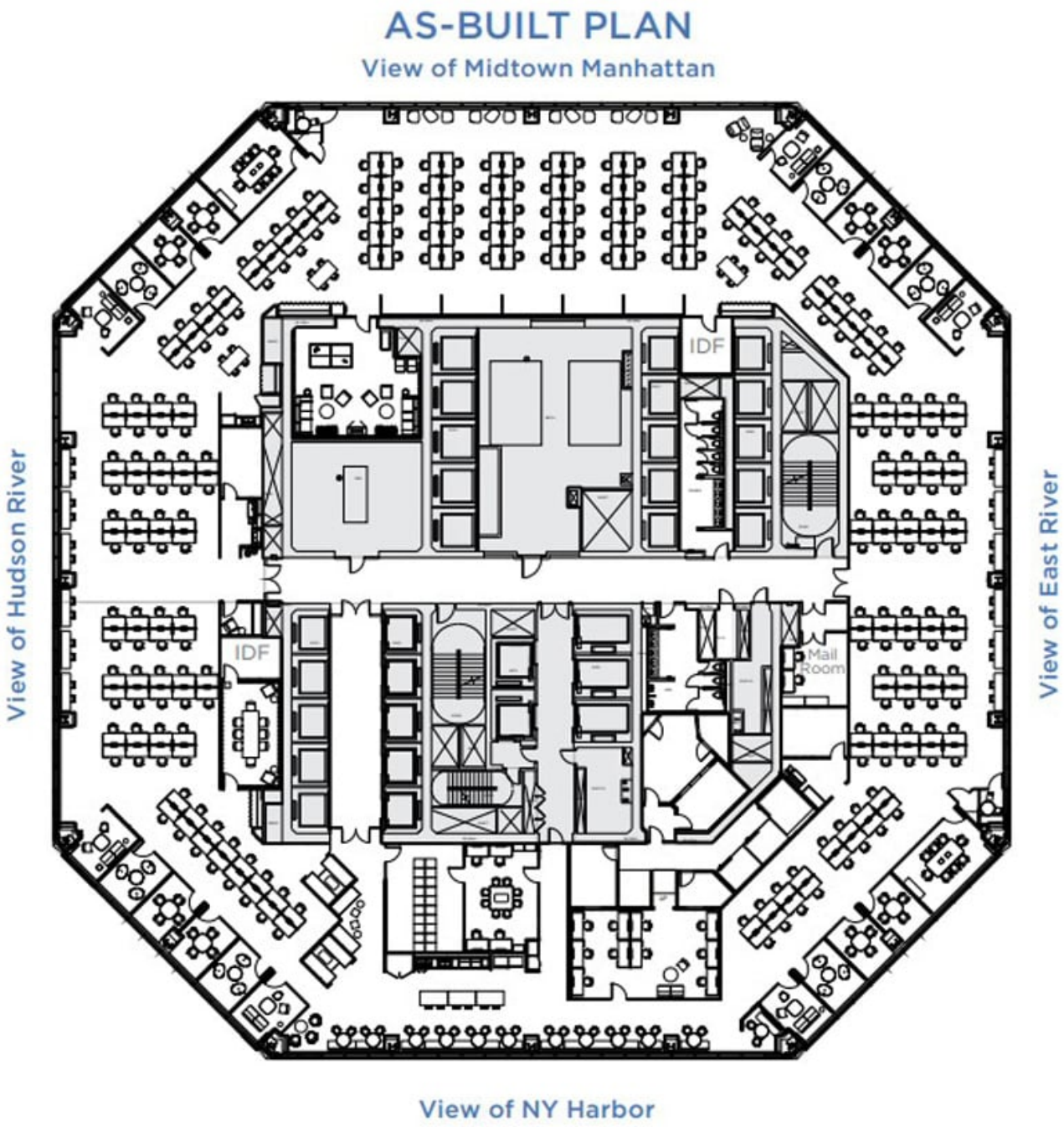
A few critical differences compound the effects of an airborne and contact related epidemic as we are experiencing now vs. those of ancient cities with high density.

1. Ancient stone cities were all ‘open-air’, that is: there was no forced air or heat through mechanical means. Windows were built as permanent openings unless extreme cold necessitated coverings. Air was flowing constantly through rooms, and buildings were not so deep that light was also penetrating the interior. Private and public buildings did not have enormous footprints with a warren of rooms usable only through artificial lighting and forced ventilation. But tenements were extremely crowded.
2. Pedestrians in ancient cities would rub elbows and bump into each other constantly face to face and could transmit pathogens easily but the herd immunity gave them an edge. They never experienced the huge and overwhelming congestion of Manhattan sidewalks, lobbies, and public transit during rush hour. The rate of virulent pathogen transmission under high-density circumstances is nearly impossible to defend against.
3. The tallest apartment buildings in the Roman Empire were

rarely over 7 stories. The *insulae* surrounding the city center reached to 10 stories in some areas and were packed with the lower classes on the upper floors while the ground floors were occupied by the wealthy and shopkeepers. The canyons created by a spate of modern high rises also blocks light and stirs up clouds of dust and dirt when windy.

Modern high-rise private condos are well protected against disease found at street level and from unit to unit, but the matter is different in high rise office blocks or skyscrapers. Each bedroom in a residential condo tower normally has a window, as well as nearly all living spaces. Fewer people, one family per unit, share air conditioners and heating systems.

Examining the suggested leasing plan (see below) for Floor 59, One World Trade Center in NYC, you will notice the nearly 100 open plan work stations situated around the core. Seating is approximately 5 to 6 feet apart. These configurations for workers are duplicated thousands of times throughout a large city center high rise cluster. The skyscraper typically does not have operable windows due to wind conditions and for safety. Occupants rely on a continually recirculated air system that contains fresh intake at periodic intervals. But the air quality is not ideal and can blow pathogens from infected workers throughout the entire floor. They may also travel through elevators from floor to floor. Individuals working in these circumstances are constantly brushing against each other, speaking at close quarters, and sharing restrooms, break rooms and conference tables that will hold any virus or germ for several hours.



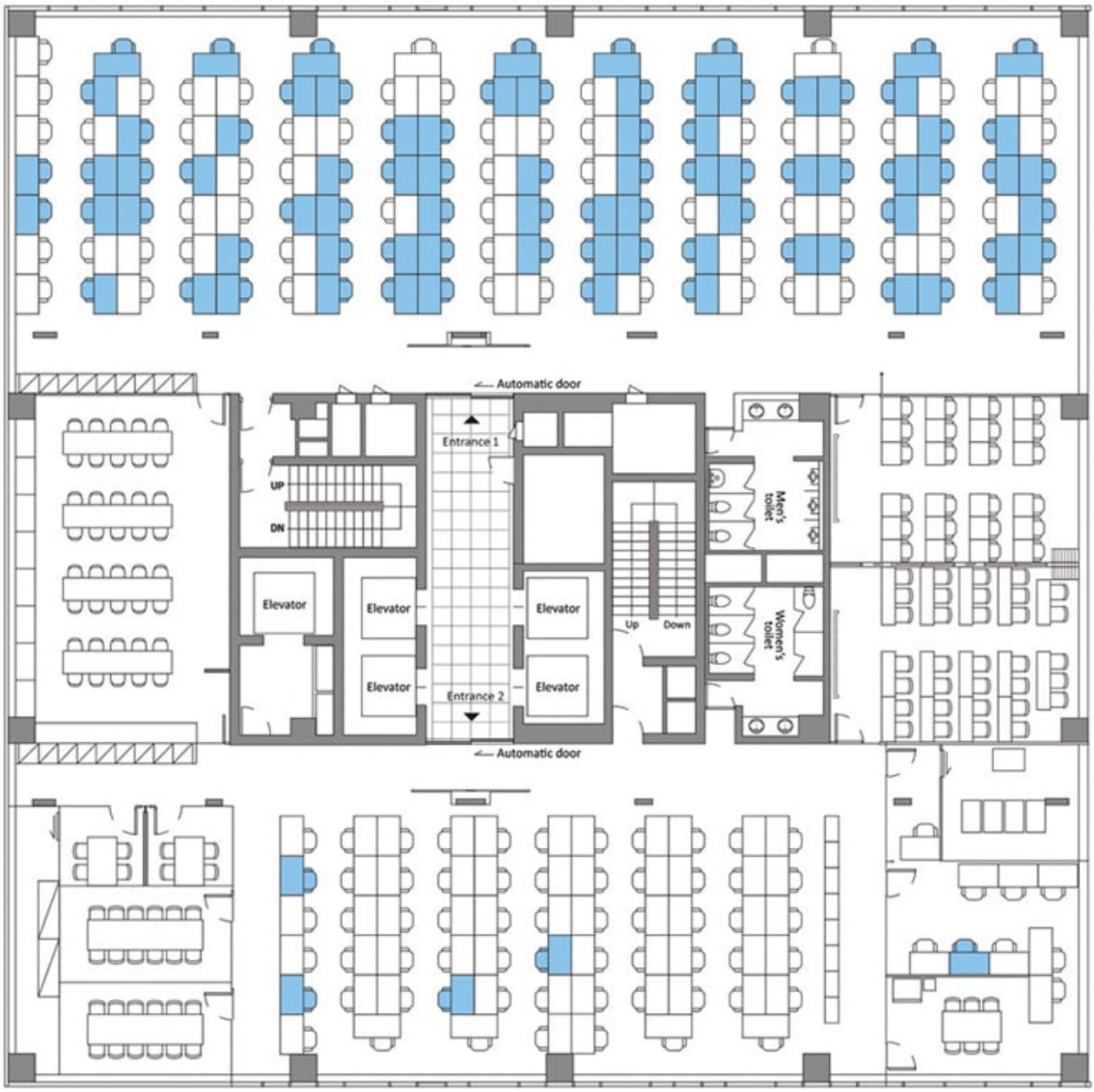
Moreover, the perimeter of each floor normally contains private offices or conference rooms which prevent ultraviolet light to penetrate the inner work areas. Ultraviolet is naturally emitted by the sun and is a key component to health while offering a nearly immediate elimination of viruses on nonporous surfaces and in the air. The typical glazing of high-rise buildings blocks UV light, even in living units in condo towers.

In addition, low humidity and cooler air conditioning—staples

for the comfort of humans and machines—are essentially breeding grounds for viruses, mold, and other pathogens.

At 94 floors and about 140 occupants per floor, there are about 13,000 people in One World Trade Center. During an 8-hour workday, it is possible, with shopping and restaurants within the building, that very few of those inside get fresh air and the benefits of sunlight.

Comparative Immunologist and Professor of Biology Erin Bromage cites a recent study (ref.) made in South Korea concerning transmission of COVID-19 in a building with higher occupant density per floor than 1WTC. The call center on the 11th floor in the building illustrated below was infected by a single person. Over a period of seven days, 94 of 216 employees (in blue) showed signs of the disease. This represents about half of those on one side of the floor and a few on the other side of the elevator stack, stairs, and restrooms.



What probably helped stem the spread of the virus further was the zoned HVAC system, so that cross contamination was limited. The obvious point to be observed here is that head to head, the distance between callers is about 4 feet, even though there are presumably sound partitions between stations. They are all speaking loudly, and the virus droplets are flying everywhere. This type of close quarter activity indoors is obviously conducive to spreading any disease.

Even though modern high rises have up to date ventilating systems, they cannot stop airborne pathogens from circulating, even if the number of fresh air changes were upped per hour.

The cost and mechanical fatigue required to heat and cool additional air changes in extreme outdoor temperature and humidity would also be a burden. The other factor is that to increase efficiency in any office working environment the temperature and humidity must be low. This condition of course helps breed and prolong any virus circulating indoors. Even if UV was introduced into all the air conditioning systems and more fresh air introduced, the many solid surfaces that are handled throughout the day by multiple occupants cannot be cleaned often enough to prevent transmission.

While these are just two examples of how high density in an 8- or 10-hour work environment contributes to the breeding of any virus or pathogen, the model is replicated throughout the high-density urban core. This archetype cannot sustain a work/living environment capable of warding off contagion.

When you multiply this type of worker density on each floor of a 50 to 80 story high rise and 20 to 100 like buildings are closely spaced and tied to underground transit systems, then you can see how transmissibility is probably impossible to contain. The fact is that the entire concept of live/transit/work and back in such environments cannot be sustained from the epidemiological viewpoint. That means that entire high dense metro areas are essentially death traps for thousands of their citizens who can further infect those in the suburbs and nearby condo apartments shuttling back and forth to work and home, to the shopping, food and entertainment areas.

Streets and sidewalks laid out in New York City were never intended to support the density that has been reached over 100 years. They were not originally planned either for the additional transfer of commuters into the downtown from suburbs miles away.

Real estate values pushing building technology in metro center cores has effectively created sleek vertical coffins for hundreds of thousands of occupants. Contemporary planning theory also supports this type of high density with claims that it furthers ‘innovation’, hospitals are readily available, pollution is minimized, pedestrian activity is encouraged for health reasons, and generally the result is a more civilized society.

During the 1918 flu pandemic, it was noted that those being treated in hospitals were succumbing at a higher rate than those in beds under outdoor tents. The curative effect of the “open-air” method was so successful that Richard A. Hoday, PhD and John W. Caron, PhD suggested in their research for The American Journal of Public Health in 2009 October that “Much more fresh air may be needed than is currently specified for hospitals, schools, offices, homes, and isolation rooms.”

Trams and buses, but especially subways represent the horizontal coffin. The extreme congestion in any subway cannot be mitigated for the transfer of pathogens. The close quarters, breathing, sneezing, coughing, talking loudly will easily transmit a virus or any germ immediately. UV lighting is now being considered to kill surface contained viruses, which is a positive step. The subway is lit artificially with no natural sunlight to clean the air or repeatedly touched surfaces (except in some areas when cars run above grade). The ventilation is not adequate so any virus or influenza can breed and spread. The UV cannot stop or kill quickly and effectively enough contact and air borne particulates. (Creating an even worse situation are allowances for the homeless to camp out in the rail cars.)

Two other horizontal coffins are airplanes and ocean liners. These are all self-contained metal tubes and boxes whose internal air conditioning, food handling, and close-quarters can only result in high transmission of pathogens through air and direct contact.

Unfortunately, military vessels are also easily contaminated.

The only way to protect against a highly infectious foreign borne pathogen is to stop it at the ‘ports,’ as merchant ships were quarantined during the Black Plague of the 1540s. We are now seeing almost instant results from blood samples or nasal swabs and these should be administered to any passenger leaving any country and all who enter via ship or airplane.

The horizontal and vertical metro coffins are another matter. It is virtually impossible to stop the rapid transmission of pathogens in either case. The entire conceptual design of live-transit-work and back, and the floor plan density and environmental conditions of building blocks must be re-examined. Similar bacterial and viral issues are evident in any artificially lit venue, whether involving sports, theater, film, or even dining. The higher the density, crowding and constant person to person contact, the more likely infection will spread.

One immediate emotional (and rational) course of action for those who are hiding in fear indoors at this time and hearing about the thousands dying nearby is to abandon their quarters, their lifestyle and the dense metro areas and move out to low-density rural towns and subdivisions in highly decentralized automobile centered communities and cities.

If concentrated populations suffer the most during pandemics,

then decentralized living and working communities may be the correct physical response for the future. The exodus from the high-density metro areas is already in motion as recent reporting by Redfin indicating: “there seems to be a profound, psychological change among consumers who are looking for houses” in rural versus urban areas.

In 1840, George Bodington, head of a tuberculosis sanatorium near Birmingham, England “had noticed that people who spent their time indoors were susceptible to tuberculosis, whereas those who worked outdoors, such as farmers, shepherds, and plowmen, were usually free of the disease. He reasoned that patients should copy the lifestyles of those who appeared immune to tuberculosis. They should live in well-ventilated houses in the country and spend much of their time outside breathing fresh air.” (from the Hoday and Caron study noted above)

While technology has allowed buildings to reach thousand-foot heights with a hundred or more floors of close quarter work areas, offices, restaurants, shops, etc. those inside these hermetically sealed and artificially sustained coffins are more susceptible to infection and disease than any other model for a work/living environment. The transit systems are short term exposures but extremely lethal and feed the pathogens to the hyperdense high rise city centers. They also carry disease back to the suburbs. I doubt that a real fix can be offered to secure the deadly combination of high dense city living and working centers with their transit systems.

If these models are not abandoned or remedied, we will be similarly unprepared for any future pandemic and will be perpetually weakened to fight viruses from the common cold to influenza.

If these structural problems cannot be mitigated then the mega-city on steroids must be abandoned in favor of low rise, healthy decentralized work and living environments. There you

will not find crowding on a sustained level—which is an archetype that invites a virulent disease to take hold and propagate.

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