



## Semiconductor Sector Commercial Real Estate Considerations



One of the most significant pain points for semiconductor companies when looking for commercial real estate is finding a location that can accommodate the unique needs of their manufacturing facilities, including factors such as:



### Proximity to a reliable power grid:

Semiconductor manufacturing requires a large amount of electricity, so access to a stable and reliable power source is critical.



### quantities of clean water:

The manufacturing process often requires large quantities of ultrapure water that must be free of contaminants, which needs to be taken into consideration when evaluating sites.

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### Adequate transportation infrastructure:

Semiconductor facilities require frequent deliveries of raw materials and shipping of finished products, so easy access to major transportation routes is essential.



### Availability of skilled labor:

Semiconductor manufacturing is a highly specialized industry that requires a skilled workforce, so companies need to be located in areas with a strong talent pool.

SEMICONDUCTOR SECTOR COMMERCIAL REAL ESTATE CONSIDERATIONS

## Limiting Environmental Regulations

The semiconductor industry contributes to roughly 31% of the world's greenhouse gases (Times of India). Considering pollution concerns, it's common to find that municipalities and local governments have implemented regulations for where these companies can operate.

Semiconductor companies are not inherently dangerous, but the materials and processes used in semiconductor manufacturing can pose risks to workers and communities if proper safety protocols are not followed.

Some of the hazards associated with semiconductor manufacturing include:

### Chemical exposure:

Semiconductor manufacturing involves the use of a variety of chemicals, including acids, solvents, and gases, which can be hazardous if not handled properly.

### Radiation exposure:

Some semiconductor manufacturing processes involve ionizing radiation, posing risks to workers if not properly shielded or monitored.

### **Electrical hazards:**

Semiconductor manufacturing equipment can generate high voltages and currents, posing risks to workers if not properly grounded or isolated. If mismanaged, the harmful impacts of mistakes in the manufacturing process can expose whole communities to the dangers listed on the left, which is why it's up to local, regional, and national governments to put additional regulations in place and consider the well-being of communities when planning for semiconductor development. Often, these considerations materialize through physical distance from populated areas.

Some environmental regulations may require semiconductor companies to build on the outskirts of cities or rural areas to minimize the impact of their operations on local ecosystems and communities. For example, air and water quality regulations, hazardous waste disposal, and noise pollution may restrict where semiconductor companies can operate and what types of activities they can conduct in certain areas. In some cases, these regulations make it more cost-effective for semiconductor companies to build in areas with fewer environmental restrictions but make it more challenging to conduct business and recruit talent.

While environmental regulations may play a role in site selection, they are just one of many factors that companies consider when making these long-term commercial real estate decisions.

## **Recruiting Talent**

One unavoidable caveat of the manufacturing process is that the talent needs to be locally available. However, the semiconductor industry is not alone in the war for talent.

There is high demand for technical roles in our ever-increasing technology-driven world. For top talent, semiconductor companies compete with other industries, such as aerospace, telecommunication, technology, manufacturing, energy, defense, transportation, and automotive companies.

Additionally, once established, talent doesn't typically flow freely between industries. It's unlikely that the skillset translates from industry to industry, regardless of education and definition of the role. For example, the skillset needed for an aerospace engineer differs significantly from a semiconductor engineer, making expanding into new markets even more complicated if the talent is not already primed for the industry's needs. With this in mind, it's also in semiconductor companies' best interest to find top S.T.E.M.-focused colleges and universities where new talent is being developed and introduced to the workforce. Making a commercial real estate decision would be moot without an available and sustainable labor pool.



### The 10 Best Colleges for STEM Majors

### Top jobs that semiconductors recruit for that can't be executed remotely:



#### **Engineers:**

Semiconductor companies require engineers with various specializations, including electrical, mechanical, chemical, and materials engineering. These engineers design, develop, and test semiconductor products, as well as the equipment and processes used to manufacture the semiconductors.



#### **Technicians:**

Technicians play a critical role in semiconductor manufacturing, working with engineers to assemble, test, and troubleshoot equipment and processes.



#### Operations and production managers:

Operations and production managers oversee the dayto-day operations of semiconductor manufacturing facilities, including production scheduling, quality control, and safety protocols.



# Research and development professionals:

Research and development professionals work on developing new semiconductor technologies and processes, as well as improving existing products and processes.

According to data from the Bureau of Labor Statistics (BLS), the top U.S. metropolitan areas with the highest number of employed engineers are:



Balancing where talent is and where it makes sense financially and environmentally may not align. For example, California is traditionally known as a difficult place to conduct business because of the additional regulations to protect the people and environment. Moreover, the cost of real estate and living/human capital make operating expensive. However, it ranks as the top location for engineering talent. This combination of factors often pushes companies to consider offshoring their production to countries with fewer restrictions than the United States.

## Geopolitical Considerations

The semiconductor industry is highly competitive, and companies must navigate competition from both domestic and foreign firms.

Geopolitical considerations can impact the ability of foreign companies to enter certain markets, as well as the availability of government support and subsidies for domestic companies.

Beyond the cost of operations, semiconductor companies need to consider intellectual property protections when planning their commercial real estate. An example to explore is the intellectual freedoms of the USA vs. China. Comparatively, with few exceptions, the USA gives significant power to the companies for their intellectual ownership, whereas China's government can supersede company ownership.

Semiconductor companies invest heavily in research and development to create new technologies and products, and protecting their intellectual property is critical to their success. Geopolitical considerations can impact the level of intellectual property protection available in different countries, as well as the ability of companies to enforce their rights in international markets.



**''** 71% of China's Fortune 500 companies are state-owned. State ownership is most common in China's strategic sectors, such as energy, telecommunications, and banking. **?** (Saqib, 2023)

### Brokerage Alignment & Understanding

Finding a commercial real estate location that meets environmental, recruitment, and geopolitical considerations can be a significant challenge for semiconductor companies. There are, however, tools and resources that can make the process easier, including access to census data, labor pool A.I., and a well-educated commercial real estate advocate that understands the industry's requirements. Having a commercial real estate broker that wields a combination of data, tenant-only advocacy, education, and experience in your specific semiconductor use case will help you to identify suitable sites, negotiate complex land-use agreements, and set your operations up for success based on a thoughtful, data-backed strategy.





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