

PPB | CAPITAL
PARTNERS

The Bridge to Alternative Investments

Financing the Future

Trends and Opportunities in
Information Technology



Unprecedented Progress

At times, the sheer volume of technological advances our world has seen since the late 1800s can make us lose sight of the pace and degree to which everyday life has improved.

Case in point...

The first form of an everyday safety measure that most Americans rarely give a second thought was proposed by John Scott Haldane in 1895. And it all started with... a *bird*. The idea of using caged canaries to detect toxic gases (specifically carbon monoxide) in coal mines was cleverly innovative.

Now, carbon monoxide detectors are found in nearly every home in America. Those needing one can use the phone that's in their pocket, touch the screen to order one for less than \$20 and have it delivered to their doorstep within an hour ... by a drone.

Yes, we move from cycle to cycle (market, societal, etc.) through peaks to troughs. But overall, the trend for many decades has been pointing up and to the right. Much of this can be attributed to technology and the Third Industrial Revolution.

Yet, after decades of progress, all investors must still ask...

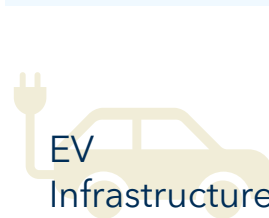
What's next?



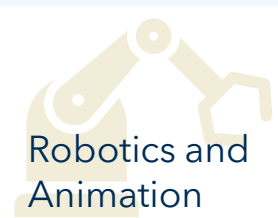
Modern
Critical
Infrastructure



Corporate
and National
Security



EV
Infrastructure



Robotics and
Animation



1895
Canaries are used to detect carbon monoxide in coal mines.



1954
The Tournament of Roses Parade is the first nationally televised color broadcast.



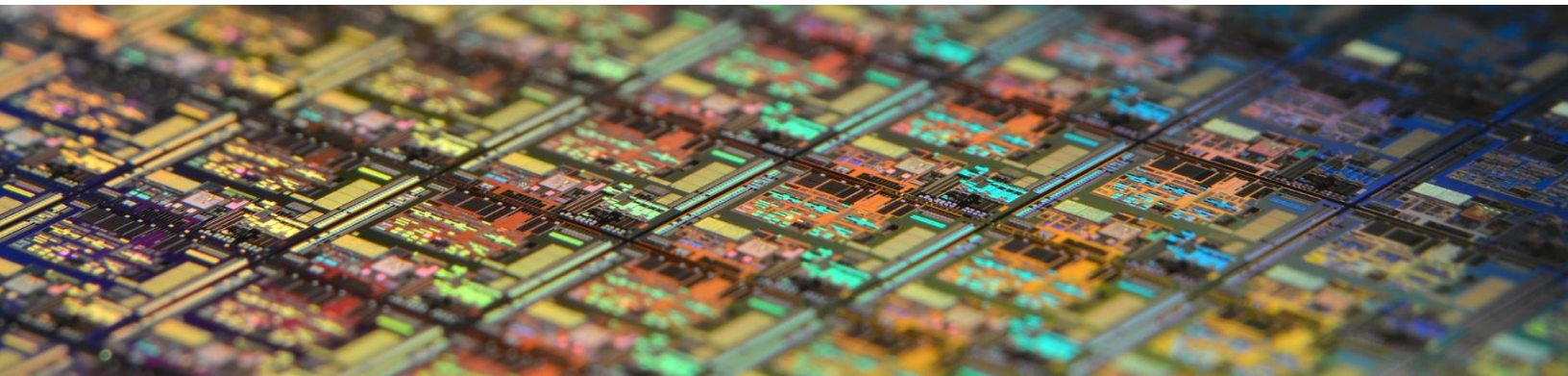
1973
The first cellular phone call is made on the streets of New York City



1983
The Internet was created when computers on different networks begin "talking" to each other



2008
Tesla sparks a revolution in the auto industry when it first manufactures the Roadster



Modern Critical Infrastructure

The Department of Homeland Security classifies critical infrastructure as the network of highways, bridges, tunnels, railways, utilities and buildings necessary to maintain normalcy in daily life. In our view, the semiconductor supply chain, telecom networks, satellites, and cybersecurity have become similarly critical to maintain that normalcy.

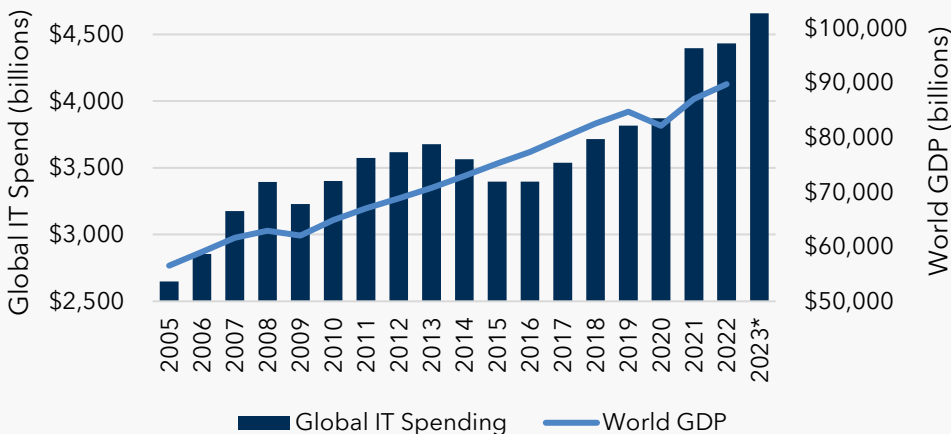
Just as fortunes were built by railroads and oil during the late 19th and early 20th centuries, there are once again opportunities in building out our modern critical infrastructure.

The four numbers to the right highlight the undeniable reliance we have on modern technology. Should communication networks go offline for even a day, the consequences would be incalculable. Even legacy infrastructure assets are now reliant on technology, as seen in the Colonial Pipeline cyber attack. As a result of the attack, 17 states were impacted, many of which had gas lines run dry for the first time since the 1973 Oil Crisis. Because of incidents like this, governments and corporations have been prioritizing investments in technology and critical supply chains.

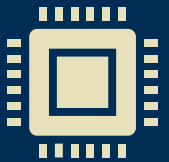
The chart below illustrates that the Global IT Spend has outpaced World GDP growth since 2005. Since 2016, IT spending has increased by 80% more than GDP growth on an annualized basis, highlighting the increasing importance of technology.

Analysts expect this growth to continue, estimating 8% growth in worldwide government IT spending in 2023. Global GDP, on the other hand, will likely grow by just 2.6%.

Cutbacks? What cutbacks?



\$280 billion
CHIPS and
Science Act



Approximately
8,000
satellites
in orbit



310,000,000
smartphone
users in the
United States



17 states
impacted by
the Colonial
Pipeline
cyberattack



Corporate and National Security

Expect Significant Tailwinds for:



Satellite and telecommunications technology



Autonomous vehicles and logistics



Cybersecurity

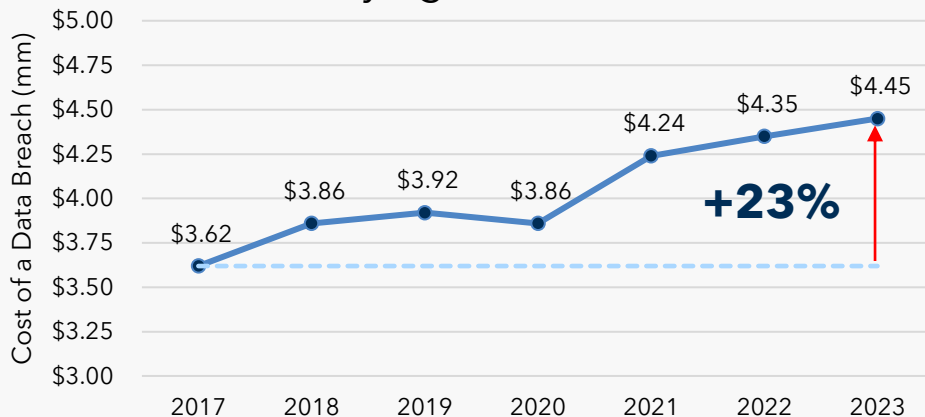
For nearly two-and-a-half centuries, the U.S. military has fought battles on land, sea and in the air. Today, the reliance on technology by our national defense demands constant innovation. Companies developing satellites, autonomous vehicles and cybersecurity are all crucial to national defense and may benefit from significant government spending.

These technologies have considerable corporate and civilian applications, as well. Advances in satellite and automation can significantly impact the efficiency and profitability of American enterprises.

It is critical for organizations and individuals to understand the impact of cybersecurity. Data from IBM shows a rising cost in the average data breach, reaching as high as \$4.45 million in 2023.

As the frequency and cost of cybercrimes increase, demand for adaptive and resilient prevention will rise in tandem. Expect budget allocations at corporations and government entities to focus on cybersecurity, mirroring the insurance spending trend over the years. Investors who deploy capital towards corporate and national cyber defense spending may benefit from these increases.

Paying the Cost



Department of Defense

Research, Development, Test and Evaluations

FY2024 Budget

\$17.8B

Science and Technology

\$1.8B

Artificial Intelligence

\$1.4B

Joint All Domain Command and Control
(High-Speed Communications)

\$145 Billion

EV Infrastructure

For the better part of the last decade, the hottest cars on the market have been electric. From stylish and innovative manufacturers like Tesla and Rivian to storied models like the Ford Mustang and BMW 7 Series, the market has determined that the future of the automobile is electric. Fueling this new electric thirst requires a complex and integrated network of EV charging stations.

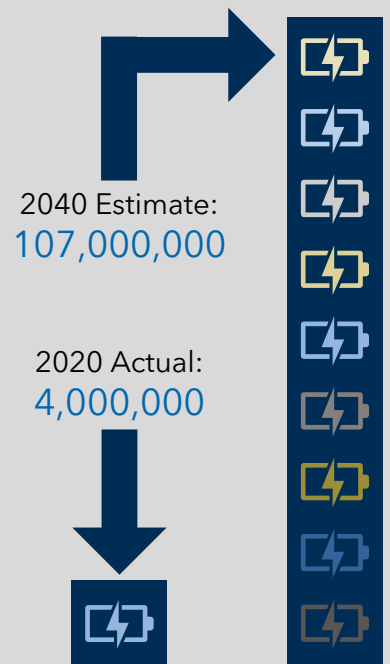
Earlier this year, Tesla announced some Supercharger stations would become open to non-Tesla EVs. Though a step in the right direction, more stations will be required to keep up with exponentially increasing EV deliveries, which are estimated to increase 10x by 2030.

As U.S. consumers and industry gradually shift to EVs, it will require a vast network of charging points in our homes, workplaces, and public stations. The time required to charge an EV means the network will look very different from that of gas stations. While necessary for long drives, intermediate locations will be less important compared to stations based in homes and offices.

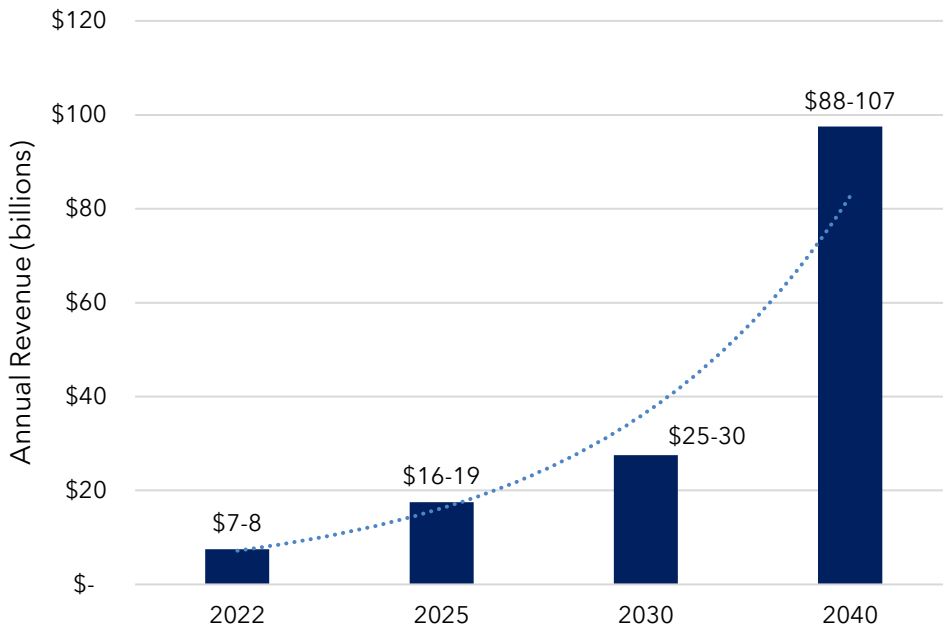
PwC estimates that by 2030 the multi-unit residential and workplace segments will each make up about 17% of the network.



Available EV Charging Points



Electric Feel
Annual EV Infrastructure Revenue



Robotics and Automation

Though we are still many years away from reaching the robot-filled society portrayed in *The Jetsons*, robotics is now a key component of our tech-enabled economy.

Today, large and hazardous industries such as automotive and chemical production are becoming reliant on robotics to improve efficiency and reduce risks. Automation in manufacturing and production is expected to expand margins in highly capital-intensive businesses while improving safety standards for workers.

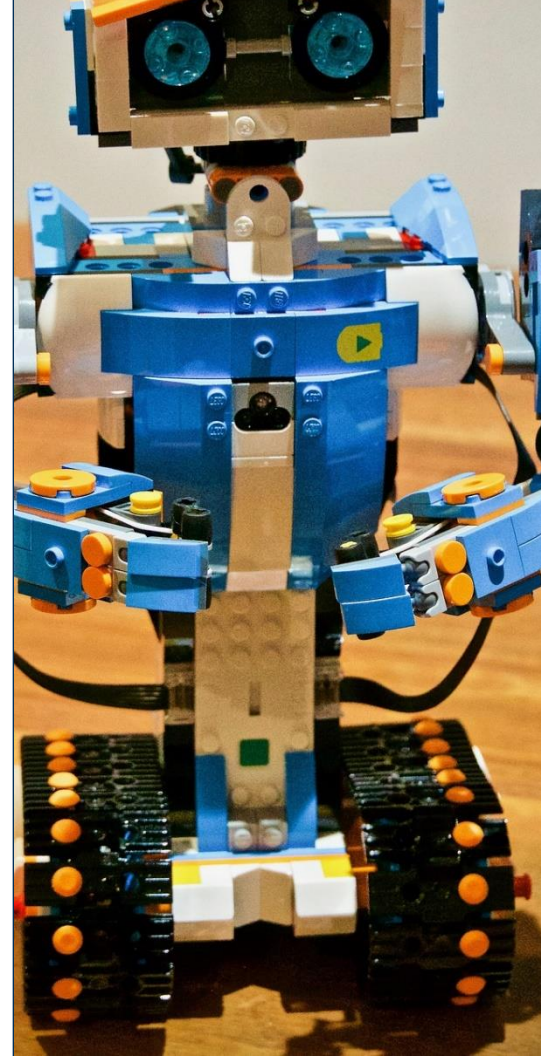
On a smaller scale, consumer-facing robots like vacuums have become a common household item. After some major acquisitions by Amazon, additional consumer-focused robotic products are expected to be released in the upcoming years.

At one time, robotics were a futuristic luxury. But in many ways, the future is now as robotics are already taking their place as integral parts of the economic landscape and will unquestionably continue to grow in importance.

The race to produce “the next big thing” doesn’t end with robotics. In fact, we are only peeling back the outer layers of the proverbial automation onion.

The seemingly vast uses for artificial intelligence (AI) have set it on a hype-fueled upward trajectory. All signs are pointing to AI earning a promising place in areas like education, self-driving capabilities, e-commerce, cybersecurity and many others.

With its innate ability to disrupt and improve older technologies and methods, we are merely scratching the surface on what it can do. Count on AI to be a key theme for investors in the coming years and decades.



Stake a Claim

Diverse opportunities for robotics

Automotive	28%
Unspecified	20%
All Others	13%
Metal and Machinery	11%
Plastics and Chemicals	10%
Food	10%
Electronics	8%

18x

Increase of investment in AI from 2013 to 2023

\$3.3 billion

2022 Federal Government AI contracts

3.5 million

Global operational stock of industrial robots in 2021

14.6%

Global increase in operational robots from 2020 to 2021

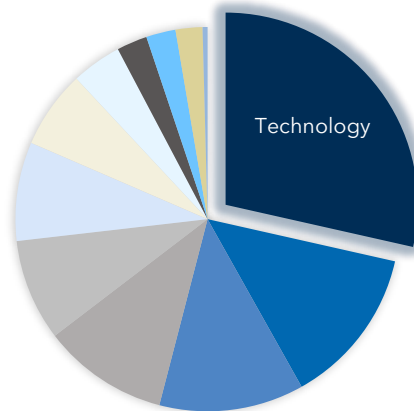
Opportunities in Private Markets

Since the turn of the century, the Technology sector has quickly grown to the largest component of the S&P 500. In the debate between public and private investing, many argue that this exposure is more than enough for any portfolio.

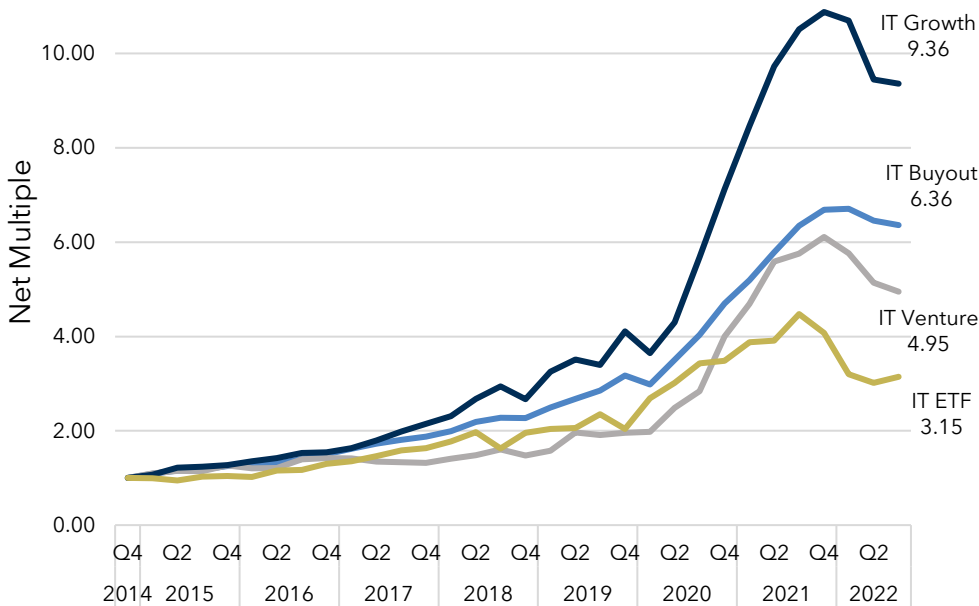
However, as more companies have stayed private for longer, those who ignore private markets are bound to miss out on significant upside potential. Since 2014, all major private equity strategies (Venture, Growth, Buyout) focused on technology have outperformed the public IT benchmark.

A replacement by no means, private market tech investments can be highly complementary to the growth and equity components of a client's portfolio and may drive long-term, generational returns.

U.S. Large Cap ETF



Private Market Strategies Outperform Public Benchmark



References and Disclosures

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Launched in 2008, PPB Capital Partners brings premier alternative investment solutions and streamlined processing to the wealth advisor community. PPB builds and operates customized private fund solutions for wealth advisory firms nationwide. In addition, PPB provides wealth advisors entry points to a roster of best-in-class institutional alternative investment managers in strategies ranging from private equity, private credit, hedge funds, real estate, venture capital and alternative income.

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