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Constructing the City of the Future

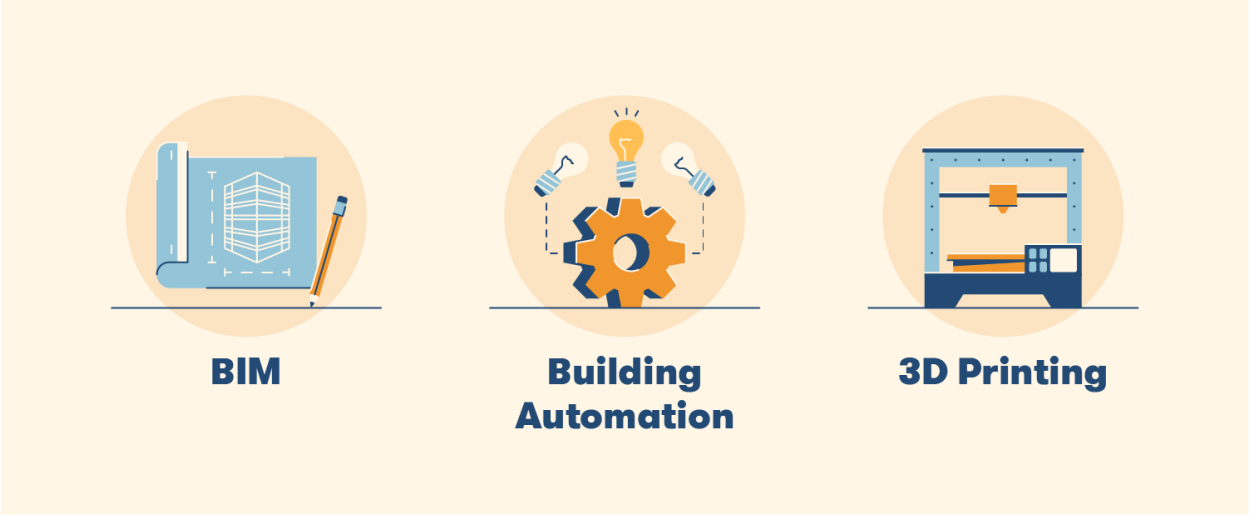
It's hard to imagine cities looking much different than they do today. Towering skyscrapers, bustling sidewalks and busy traffic have been the norm for decades, and tightly-packed buildings leave little room for new construction. However, as the global population grows and more people flock to urban areas, new methods to build efficient, sustainable cities could drastically change the urban landscape in just a few decades.

Cities all over the world are searching for new ways to expand urban landscapes, reduce pollution, and create safer, healthier spaces for their residents. The world's future cities will rely on advanced construction technology and innovative urban planning initiatives to achieve this, some of which are already in development today.

Read on to learn how construction technology and urban planning trends are paving the way for future cities or skip to the animated infographic below to see what cities could look like in 50 years.

Construction Technology Paving the Way

As plans for the city of the future begin to take shape, so do the construction techniques required to build it. The future of urban construction will rely on cutting-edge technologies that redefine how buildings are built and add a level of efficiency never seen before.



3D Modeling

Construction companies are already beginning to take advantage of these technologies to create safer, more efficient structures. Architects and engineers can use building information modeling (BIM), an intelligent software modeling process, and artificial intelligence (AI) to view 3D building designs and make adjustments before construction even starts. These technologies can also be used to monitor progress throughout the construction process and catch mistakes before they happen.

Building Automation Technology

The green building market is expected to reach $99.8 billion by 2023, and it will only continue to grow as governments crack down on CO2 emissions. Many future cities will rely on eco-friendly construction to meet their sustainability goals, and building automation can help achieve that.

Building automation systems are relatively common in the construction industry, but companies are just beginning to use them to regulate energy usage and reduce waste. Automated HVAC, electrical and mechanical systems can regulate energy consumption and storage and eliminate human error. Some buildings are already saving up to 30% on energy costs by utilizing automation, and it can help future buildings become green-certified.

Prefabricated Building Materials

Modular construction and 3D-printed building materials are also great candidates for reducing the environmental impact of future construction projects. These technologies allow builders to create sustainable materials offsite and help reduce construction waste. 3D-printed building elements can be constructed using durable materials like sand, metal, and concrete, and they require fewer workers to construct.

What Will Future Cities Look Like?

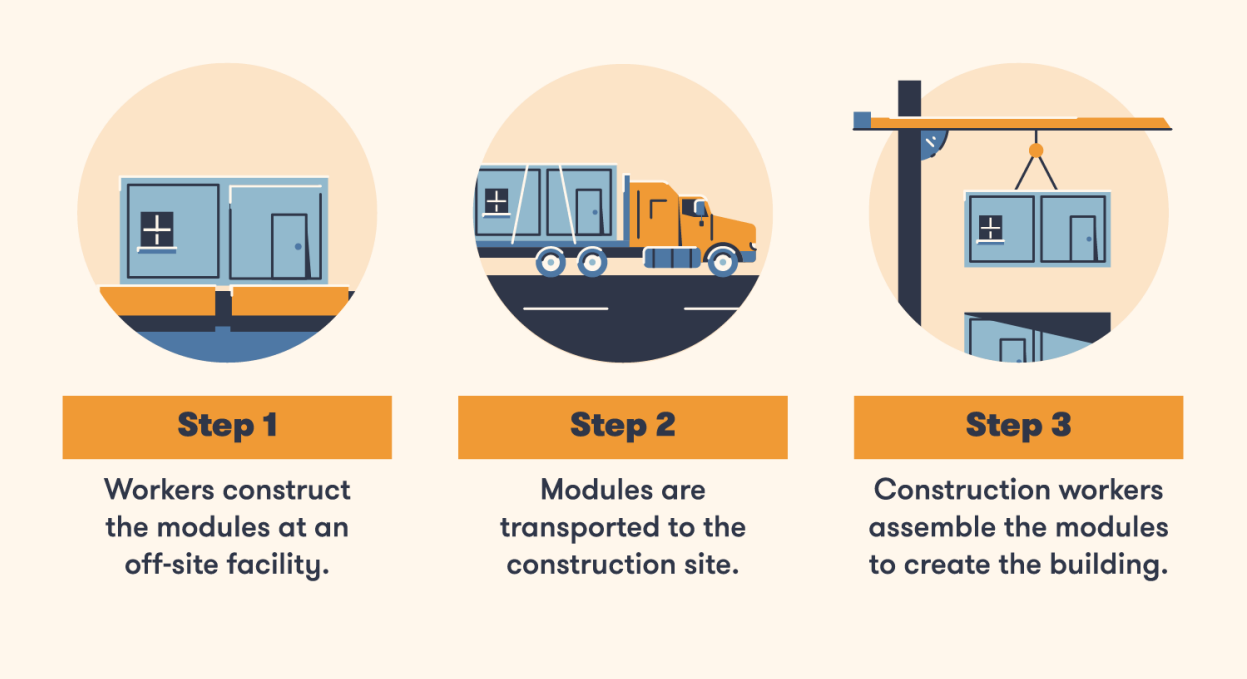
Over the next few decades, cities could look very different than they do today. Many future advancements are already in the planning and development stages, and they could become the norm in as little as 20 to 50 years. The following developments give a taste of what future cities could look like.

Modular Skyscrapers

Modular construction is a small but growing subset of the construction industry that aims to streamline the building process and promote sustainability. Modular technology is often used for homes and smaller buildings, but modular skyscrapers are becoming popular in urban areas that have rapidly growing populations.

Modular skyscrapers are built with prefabricated units, or modules, made from sustainable building materials. These modules are constructed off-site, then transported to the construction

site where they are quickly assembled. This process condenses the project timeline and reduces construction waste, making it much more efficient than traditional building methods.

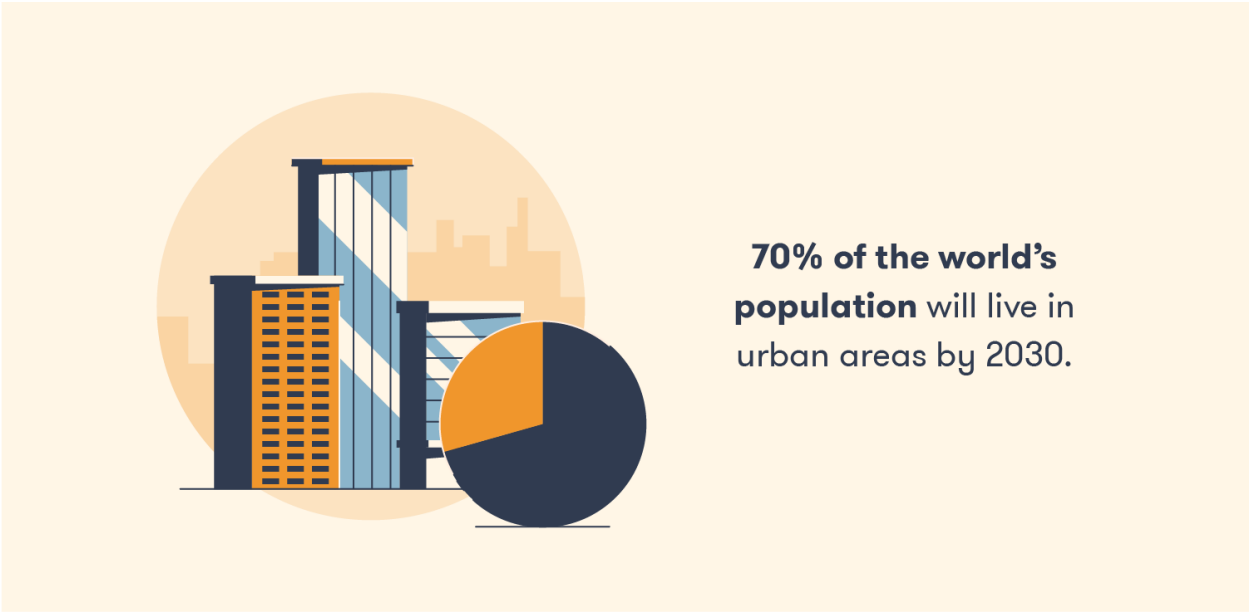


The world's tallest modular skyscrapers will soon open their doors in Singapore, and more are soon to follow. The Avenue South Residences are two 56-story residential towers made from 2,984 prefabricated modules.

After construction began in 2019, architects noticed that the project required fewer on-site workers and allowed factory employees to socially distance more than they would on a busy construction site. New social distancing standards and altered workplace models put in place during the COVID-19 pandemic could accelerate the push for modular buildings and create new demand for socially distanced construction methods.

Net-Zero Energy Buildings

Experts predict that 70% of the world's population will live in urban centers by 2030. Many cities are already struggling with dangerous levels of pollution and carbon emissions, and growing populations will only add to the problem unless urban planners find more sustainable solutions. Fortunately, net-zero energy buildings offer a green alternative to traditional building models.



To keep global warming below two degrees Celsius, countries that signed the Paris Agreement will need to create a net-zero building sector by 2050. Cities can achieve this by building net-zero energy commercial and residential buildings that use renewable energy sources and only use as much energy as they can create on-site.

Net-zero energy buildings have yet to be adopted on a global scale, but national and state-level emissions mandates have urged governments and private organizations to invest in the technology. For example, the National Renewable Energy Laboratory is currently researching new renewable energy technologies, and California's recent climate change legislation calls for all new construction projects to achieve net-zero emissions.

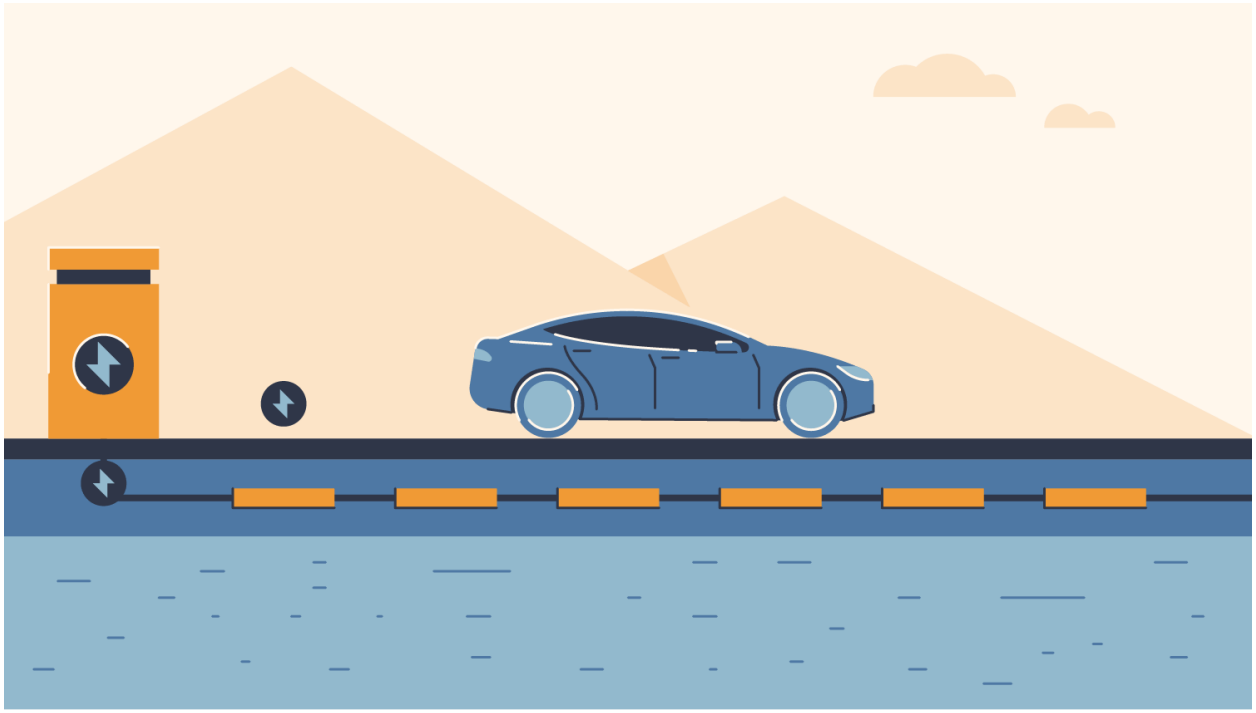
Smart Highways

Highway systems have remained relatively unchanged over the past few decades. However, with electric vehicles entering the market and self-driving cars on the horizon, our roads and highways are due for an upgrade.

Companies all over the world are starting to invest in technologies to make highways more efficient, safe and sustainable. Multiple technologies can be incorporated into a roadway to make it "smart." Some of the technologies currently in development and planning stages include:

- **Temperature Sensitive Road Paint:** Adding photoluminescent powder to road paint causes road lines, barricades and other markings to light up at night, making roads safer to navigate.
- **Weather, Traffic and Maintenance Sensors:** Dynamic sensors in highway systems can detect and transmit data on weather conditions, repairs and traffic delays.

- **EV-Charging Roads:** Roads embedded with electric rails and other hardware could charge electric vehicles as they drive.
- **Solar Roads:** Solar panels placed along roadways can power illuminated street signs and heat strips to help melt snow and ice.



Some examples of smart highway technology have already hit the road, including automatic electric tolls, motion sensors on traffic lights and GPS technology that tracks your location as you move. More advanced highway technology might feel far off, but countries like Sweden and the Netherlands are already testing out EV charging roads and glow-in-the-dark road paint to streamline their highway systems.

Electric Public Transit

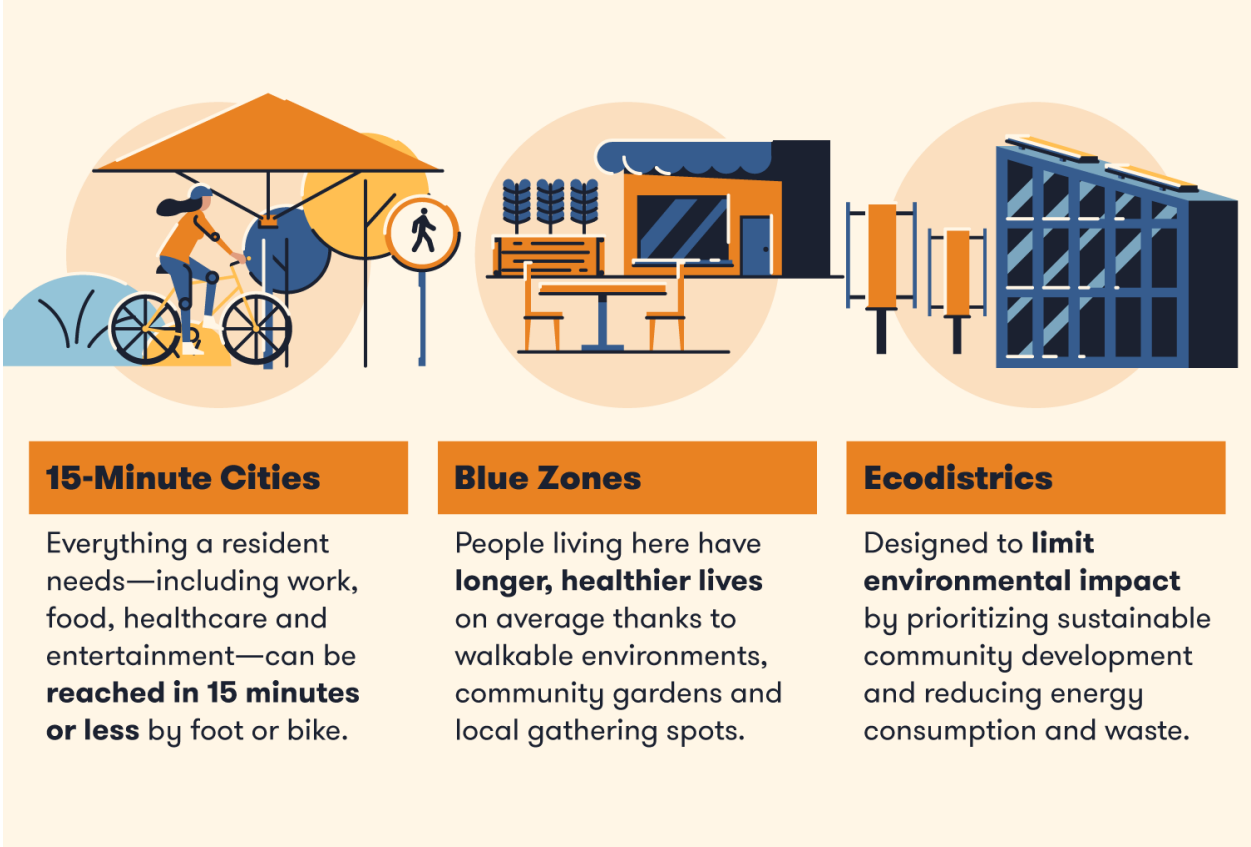
Public transportation has always been a greener alternative to cars, cities can take it a step further by implementing fully electric public transit systems that reduce CO2 emissions and eliminate the need for fossil fuels.

The U.S. introduced the BUILD GREEN Infrastructure and Jobs Act in March 2021 as part of a plan to electrify the country's public transportation systems. This bill would put $500 billion towards electrifying the nation's trains and buses and support the current administrations' plan to transition to a renewable energy future. The US Department of Transportation also recently began awarding a total of $182 million in grants to transit agencies wishing to add electric buses to their fleets.

This push for electric public transportation is happening in other countries as well. The European electric bus market rose 48% in 2018, and China currently has the largest fleet of electric busses in the world. A Bloomberg report predicted that half of the world's buses could be fully electric by 2025, making electric transportation a dominant force in cities of the future.

Future Urban Planning Trends

Urban planning trends change over time as cities grow and evolve. What works right now might not work 20 years down the road, and urban planners are constantly searching for new ways to update outdated systems. The following urban planning trends are still in their infancy today but could become the norm before we know it.



15-Minute Cities

Fueled by climate change and the COVID-19 pandemic, 15-minute city concepts are quickly gaining traction among urban planners across the globe. 15-minute cities are communities in which everything a resident needs—including work, food, healthcare and entertainment—can be reached in 15 minutes or less by foot or bike.

While the idea has been around for decades, the modern 15-minute city concept originated in Paris, France, a city known for its frantic, fast-paced energy. Anne Hidalgo, Paris' mayor,

appointed a commissioner for the 15-minute city and has made the concept a top priority for future urban planning projects. Some of her recent projects include creating mini green spaces throughout the city, banning high-polluting vehicles and banning motorized vehicles from the Seine Quays.

15-minute cities are gaining momentum around the world as virtual and hybrid workplaces become more common. As people begin spending more time in their communities, the demand for neighborhoods with a more diverse range of businesses and public resources will continue to rise.

Blue Zones

The term “blue zones” was first coined by author Dan Buettner in 2005 after he studied communities around the world where people lived longer than average lives. Blue zones are regions where the world’s oldest populations live, including Okinawa, Japan; Sardinia, Italy; Nicoya, Costa Rica; Icaria, Italy; and the Seventh-Day Adventist community in Loma Linda, California.

Blue zone inhabitants experience fewer instances of chronic disease, and they live healthier lives on average than the rest of the world. Buettner attributed this to the following four concepts:

- Living with purpose
- Moving regularly
- Robust social support systems
- Making the “healthy choice the easy choice.”

While the concept of blue zones is heavily tied to human behavior, it can be applied to urban planning on a citywide scale. Fort Worth, Texas and North Port, Florida have already moved to adopt blue zone principles by creating walkable environments, community and rooftop gardens, local gathering spots and a mixture of development and housing types.

Ecodistricts

Ecodistricts are neighborhoods that limit their environmental impact by prioritizing sustainable development and reducing energy consumption. Similar to blue zones, ecodistricts are also designed to promote diverse social environments to increase residents’ quality of life. They achieve this by utilizing sustainable and recycled building materials, renewable energy sources, eco-friendly forms of transportation and state-of-the-art waste management systems.

While ecodistricts are popping up in cities all over the world, countries in Northern Europe—like Sweden, Germany and France—are leading the effort. The city of Paris alone has at least four ecodistricts, and plans for more are currently in the works. The Hammarby Sjostad ecodistrict in Sweden equips its buildings with solar panels to provide electricity, and its heating system is fueled by biofuel, combustible waste and water from its water treatment plant.

Modern Cities Leading the Way

Some cities are already adopting futuristic urban planning trends to kickstart their transition to a more sustainable, efficient future. The following cities have implemented unique technologies that create a model for what cities of the future could look like.

Los Angeles, California

Los Angeles is at the forefront of sustainable urban innovation in the U.S. Because LA is a coastal city in a state prone to drought, urban planners have kickstarted efforts to make the city more sustainable and drought-resistant in recent years. The city adopted a Green New Deal in 2019 as part of its sustainable city plan. It set the following targets:

- 100% renewable energy by 2045
- Recycle 100% of wastewater by 2035
- Reach 100% net-zero emissions by 2050
- Create 400,000 green jobs by 2050
- Fully electrify transportation by 2030
- Divert 100% of waste from landfills by 2050
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To help achieve these goals, the city has already incorporated sustainable architecture into its urban planning initiatives. Los Angeles became the first city to control its street lighting through mobile and cloud-based technology, ensuring that lights aren't left on longer than they need to be. Landscape architects have also begun replacing water-inefficient plants with native, drought-resistant flora in urban areas to help conserve water and diversify the landscape.

La Paz, Bolivia

At up to 3,600 feet above sea level, La Paz is one of the highest cities in the world. The city is known for its winding streets and steep mountain slopes, making it simultaneously beautiful and difficult to traverse. For those who don't have access to a car, getting around used to require setting out on foot or relying on the city's minubusses, a fleet of privately-owned vans with unpredictable routes.

To revolutionize its transportation system and connect previously inaccessible parts of the city, La Paz began building an advanced cable car system called "Mi Teleférico" in 2014. The system consists of constantly moving cable cars that can fit up to 10 people and have almost no wait time. Since its inception, Mi Teleférico has expanded to include seven operational lines stretching from La Paz to the city of El Alto, a growing metropolitan area bordering the capital city.

Mi Teleférico is the first public transportation system in the city that supports the needs of people with disabilities and impaired mobility. Its stations span across multiple socioeconomic urban areas, and it significantly reduces commute times for workers traveling from El Alto to La Paz. It also only costs three bolivianos ($0.45) to ride, making it accessible to low-income commuters.

Mecca, Saudi Arabia

Mecca, Saudi Arabia is home to the Kaaba, one of the most sacred sites of the Islamic faith. Around three million Muslims travel to Mecca every year over five days to visit the Kaaba, and the city has had to adapt to the massive influx of people and overwhelming crowds.

The Saudi government invested over $20 billion to upgrade the Masjid al-Haram, the Great Mosque, to accommodate the throngs of people that travel there every year. This effort involved building eight-sided platforms around the Kaaba, a holy site that all travelers visit on their hajj trip, to help streamline the flow of people.

Engineers also installed a high-tech series of pneumatic tubes at the Great Mosque to accommodate the 600 tons of trash created on-site each day. The trash is dropped into openings on-site, then sucked at 40 mph through an underground system to a station over a mile away.

Today's most advanced cities and urban planning trends could lay the groundwork for city planning for years to come. While we can't predict exactly what the city of the future will look like, it will reimagine the way we think about sustainability, transportation and the way buildings are built.