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Exploring Major Brands for Mobile Home Furnace Installations **Aligning System Specifications with Mobile Home AC Requirements** **Evaluating Carrier Options for Mobile Home Air Conditioning** **Navigating Trane Models for Mobile Home Heating** **Selecting Goodman Units for Reliable Mobile Home Climate Control** **Verifying Rheem Specifications in Mobile Home HVAC Retrofits** **Identifying Compatible Parts Across Multiple Mobile Home Brands** **Adapting Different Brand Coils and Compressors for Mobile Home Use** **Maintaining Uniform Performance with Mixed Brand Components** **Comparing Equipment Sizes to Mobile Home Square Footage** **Assessing Future Upgrade Paths for Mobile Home AC Brand Choices** **Checking Warranties Offered by Various Mobile Home HVAC Brands**
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Maintaining Uniform Performance with Mixed Brand Components

Overview of HVAC needs specific to mobile homes

In the world of heating, ventilation, and air conditioning (HVAC) systems, maintaining uniform performance is critical for ensuring efficiency, comfort, and longevity. Emergency repairs are often needed during extreme weather events **hvac mobile home** gas. Imagine an orchestra where each instrument plays in harmony; similarly, every component within an HVAC system must function seamlessly together to achieve optimal results. However, when dealing with mixed brand components, achieving this uniformity can present unique challenges.

First and foremost, the importance of uniform performance in HVAC systems cannot be overstated. It ensures that the environment remains consistently comfortable by maintaining stable temperatures and humidity levels. This not only enhances occupant comfort but also aids in energy conservation by preventing the system from working harder than necessary to compensate for inefficiencies or imbalances. Moreover, consistent performance reduces wear and tear on individual components, extending their lifespan and reducing maintenance costs over time.

When incorporating mixed brand components into an HVAC system, compatibility becomes a key concern. Each manufacturer designs their products with specific standards and specifications in mind. Mixing brands can lead to mismatches in component sizes, power requirements, or control mechanisms. For instance, a blower motor from one brand might not operate optimally with a control board from another due to differences in voltage requirements or communication protocols.

To overcome these challenges and maintain uniform performance with mixed brand components, several strategies can be employed. First is thorough research; understanding the specifications of each component ensures they meet the necessary criteria for

compatibility. Consulting with knowledgeable professionals who have experience integrating different brands can also provide valuable insights and recommendations.

Additionally, advances in technology have led to the development of universal controls and adaptable interfaces designed to bridge gaps between disparate components. These solutions help synchronize operations across different brands by standardizing communication protocols or adjusting performance parameters dynamically.

Routine maintenance is another crucial factor in sustaining uniform performance across mixed brand systems. Regular inspections allow early detection of potential issues such as leaks or blockages that could disrupt system balance. Cleaning filters and coils frequently prevents buildup that might impede airflow or heat exchange efficiency.

Finally, documenting all modifications made during installation helps track any changes affecting system dynamics over time-vital information when troubleshooting future problems.

In conclusion, while integrating mixed brand components into an HVAC system poses certain challenges regarding maintaining uniform performance-by prioritizing compatibility research utilizing adaptive technologies conducting routine maintenance practices-and leveraging expert knowledge-it's entirely possible to create a harmonious multi-brand ensemble capable of delivering consistent comfort efficiently year-round just like how every musician contributes towards creating beautiful symphony music piece despite playing different instruments under single conductor's guidance!

In today's dynamic market, companies often find themselves integrating various brand components in an effort to maximize efficiency and leverage diverse strengths. However, maintaining uniform performance with mixed brand components presents a unique set of challenges that cannot be overlooked. The pursuit of seamless integration is akin to assembling a puzzle where each piece, or component, must fit perfectly to create a coherent picture.

First and foremost, the challenge lies in aligning disparate brand identities. Each brand component carries its own legacy, culture, and operational ethos. When these components are brought together under one umbrella, the risk of clashing identities emerges. For instance, merging the innovative spirit of a tech startup with the traditional practices of a well-established corporation requires careful navigation to ensure that neither loses its inherent

value while embracing new synergies.

Additionally, technological compatibility can pose significant hurdles. Different brands often operate on varied platforms and systems tailored to their specific needs. Ensuring that these technologies communicate effectively without sacrificing performance or security is crucial but complex. The process involves not only technical adjustments but also training employees to adapt to new tools and processes without disrupting workflow.

Another critical aspect is maintaining consistent customer experience across all touchpoints. With mixed brand components, there is potential for inconsistencies in service delivery or product quality that can confuse or alienate customers. Establishing unified standards while respecting each component's distinct characteristics demands meticulous planning and continuous monitoring.

Furthermore, there are logistical considerations such as supply chain integration and resource allocation. Divergent supply chain strategies may lead to inefficiencies if not harmonized properly. Similarly, resource distribution must be balanced so that no single component overshadows others in terms of budget or manpower allocation.

Finally, communication plays a pivotal role in overcoming these challenges. Transparent dialogue among stakeholders fosters understanding and collaboration essential for successful integration. Creating cross-functional teams can help bridge gaps between different corporate cultures and operational methodologies.

In conclusion, integrating different brand components while maintaining uniform performance is an intricate endeavor requiring strategic foresight and adaptability. It involves navigating cultural differences, ensuring technological harmony, delivering consistent customer experiences, managing logistics efficiently, and fostering open communication channels. By addressing these challenges head-on with thoughtful strategies and a commitment to collaboration, organizations can harness the full potential of their diverse brand elements to drive sustained success in an increasingly competitive landscape.

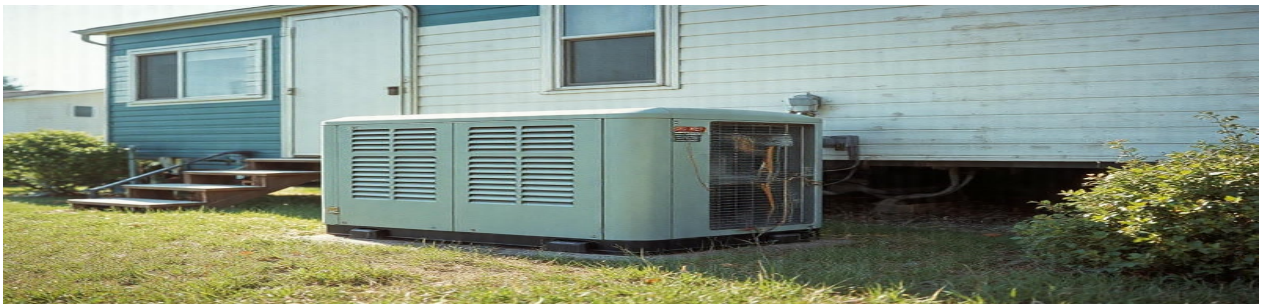
Affordable Payment Plans for Upgrading Mobile Home AC Systems



Choosing the right payment plan for upgrading your mobile home AC system is a crucial decision that can significantly impact your financial stability and comfort at home.. With numerous options available, it's essential to consider several factors to ensure you select a plan that aligns with your needs and budget. Firstly, assess your financial situation.

Posted by on 2024-12-30

Aligning Equipment Compatibility with Financing Options in Mobile Homes



In the dynamic world of mobile homes, aligning equipment compatibility with financing options is a crucial element that can significantly impact the success of any project.. The process involves ensuring that the equipment used in mobile home construction or renovation is not only technically suitable but also financially feasible.

Posted by on 2024-12-30

Understanding Financing Options for Mobile Home HVAC

In today's fast-paced world, where technological advancements are continually pushing the boundaries of innovation, consumers often find themselves mixing and matching components from different brands to create customized solutions. Whether it's in the realm of technology, automotive, or home appliances, the allure of combining the best features from various brands can be irresistible. However, achieving uniform performance with mixed brand components is not always straightforward. There are several key factors that one must consider to ensure a harmonious integration.

Firstly, compatibility should be at the forefront of any consideration when mixing brands. Not all components are designed to work seamlessly with those from other manufacturers. It's essential to research and understand if the components you intend to combine have compatible interfaces or standardized connections. For instance, when assembling a computer system using parts from multiple brands, ensuring that the motherboard supports the RAM and processor specifications is crucial for optimal performance.

Secondly, quality consistency across different components plays a significant role in maintaining uniform performance. While one brand may offer superior durability in one component type, another might excel in efficiency or speed elsewhere. It's vital to assess whether these attributes align well together without causing bottlenecks or inefficiencies in your overall setup. For example, pairing a high-speed solid-state drive with an outdated processor could negate any potential benefits due to limitations imposed by older technologies.

Another critical factor is warranty and support services provided by different manufacturers. When integrating mixed brand components, disparate warranty terms can complicate troubleshooting and repairs. Ensuring that each manufacturer's support policies align well enough to address potential issues comprehensively can save time and resources in the long

run.

Additionally, considering software compatibility is equally important as hardware interoperability. Different brands may have unique drivers or proprietary software that need harmonization for efficient functioning within a mixed-brand environment. Keeping software updated and ensuring cross-compatibility through third-party tools or patches can help mitigate risks associated with software conflicts.

Lastly, aesthetics and user experience should not be overlooked when creating a cohesive setup with mixed brand components. Consistent design language across devices can enhance usability and provide an intuitive user experience. Moreover, considering ergonomic aspects such as interface layouts or control mechanisms ensures that users interact effortlessly with their systems regardless of component origins.

In conclusion, while mixing brands offers flexibility in customization and potentially superior performance outcomes by leveraging diverse strengths across products, it requires careful planning and consideration of key factors like compatibility, quality consistency, warranty policies, software interoperability as well as cohesive user experience design principles. By meticulously evaluating these aspects before embarking on such endeavors ensures that users achieve their desired outcome—a seamless integration resulting in uniform performance despite varied component origins.





Explanation of common financing packages available

In today's rapidly evolving technological landscape, maintaining uniform performance while using mixed brand components is a challenge that many IT professionals and enthusiasts face. Whether it's building a custom PC or managing an enterprise-level data center, ensuring compatibility and efficiency across different components is crucial for achieving optimal

performance. To navigate this complex terrain, adhering to best practices is essential.

The first step in ensuring compatibility is understanding the specifications and requirements of each component. This involves conducting thorough research on the hardware specifications, such as voltage requirements, form factors, and connection interfaces. For instance, when integrating a new graphics card from one brand with a motherboard from another, it's vital to verify that both components support the same PCIe version. Mismatched versions can lead to reduced data transfer rates or even incompatibility issues.

Another critical factor is firmware and driver updates. Manufacturers often release updates to improve compatibility with other hardware or to fix bugs that may arise during use. Keeping all components updated ensures they can work together seamlessly without encountering unforeseen glitches that could hinder performance.

Furthermore, power supply considerations cannot be overlooked. Different brands may have varying power demands; thus, ensuring your power supply unit (PSU) can accommodate these needs is paramount. Opting for a PSU with modular cables and sufficient wattage can prevent potential bottlenecks and provide stable power delivery across all components.

Testing plays a pivotal role in maintaining uniform performance when dealing with mixed brand components. Before fully deploying any setup, conducting comprehensive benchmark tests helps identify any weaknesses or incompatibilities within the system. Tools like stress testing software can simulate heavy usage scenarios to pinpoint areas where performance may degrade or fail altogether.

Additionally, fostering open communication between component manufacturers and users can greatly aid in resolving compatibility issues swiftly. Engaging with online forums or support communities can provide valuable insights from others who have faced similar challenges.

Lastly, documentation is an often-overlooked but vital aspect of managing mixed brand environments efficiently. Keeping detailed records of component specifications, firmware versions, and configuration settings allows for easier troubleshooting if issues arise later on.

In conclusion, maintaining uniform performance with mixed brand components requires diligence in research, regular updates, careful planning of power requirements, rigorous testing procedures, active community engagement, and meticulous documentation practices.

By adopting these best practices, one can ensure not only compatibility but also sustained efficiency across diverse hardware ecosystems-ultimately leading to a smoother user experience and prolonged lifespan of technology investments.

Key factors to consider when choosing a financing option

Maintaining uniform performance in systems that utilize mixed brand components is a challenge akin to conducting an orchestra with musicians from different backgrounds. Each component has its own specifications, tolerances, and behavior under various conditions. To ensure harmony among these disparate parts, regular maintenance and inspection become imperative.

Firstly, understanding the manufacturer's guidelines for each component is crucial. These guidelines offer insights into optimal operating conditions and maintenance schedules. It's essential to keep these manuals handy as they provide valuable information on compatibility issues and specific care instructions necessary for maintaining peak performance.

One of the primary steps in regular maintenance is ensuring all components are clean and free from debris. Dust and dirt can compromise the efficiency of any system, leading to overheating or mechanical failure. Therefore, periodic cleaning should be part of your routine. Use appropriate tools like soft brushes or compressed air cans to remove dust without damaging sensitive parts.

Lubrication plays a critical role in maintaining mechanical components. Different brands may recommend specific lubricants; hence, it's vital to adhere to these suggestions to prevent undue wear and tear. Regularly check moving parts for signs of friction or noise which could indicate inadequate lubrication or impending failure.

Electrical connections should also be inspected frequently. Loose connections can lead to erratic performance or even damage other components within the system due to voltage fluctuation. Tightening screws and checking for corrosion can help maintain electrical integrity.

Calibration of sensors and meters is another essential aspect of maintenance when dealing with mixed brand systems. Discrepancies in readings can lead to improper adjustments that affect overall system performance. Regularly scheduled calibration ensures accuracy across all devices, allowing them to work in unison effectively.

Firmware updates are often overlooked but are crucial for maintaining compatibility between different branded components. Manufacturers release updates not only for security reasons but also to enhance functionality and interoperability with other products. Keeping firmware up-to-date ensures that all parts communicate efficiently under current protocols.

Moreover, it's important to establish a comprehensive record-keeping system for all maintenance activities performed on the equipment. This documentation aids in tracking patterns over time, identifying recurring issues that might require more intensive investigation or even replacement of certain components.

Training personnel who handle these systems cannot be understated either. They need a thorough understanding of how each brand's component operates within the larger framework so they can identify potential problems early on before they escalate into major failures.

Lastly, consider establishing partnerships with vendors who supply your mixed-brand components; their technical support can prove invaluable when resolving complex interoperability issues swiftly.

In conclusion, regular maintenance coupled with diligent inspections forms the backbone of sustaining uniform performance amidst diverse brand ecosystems-like nurturing an orchestra where every musician knows their role yet adapts seamlessly together under skilled direction ensuring symphonious outcomes time after time.

Personal Loans for HVAC Systems

In the realm of technology and electronics, enthusiasts often find themselves drawn to the allure of mixed brand setups. Whether it's combining a graphics card from one manufacturer with a motherboard from another, or integrating peripherals from various brands into a single system, the potential for enhanced performance and customization is significant. However, these setups can also present unique challenges that require thoughtful troubleshooting to maintain uniform performance across all components.

One of the most common issues encountered in mixed brand configurations is compatibility. Different manufacturers may design their products with varying specifications and standards, which can lead to conflicts when these components are integrated into a single system. For instance, a graphics card might not fully utilize its capabilities if paired with an incompatible motherboard. To mitigate such issues, users should thoroughly research component specifications before purchase and consult compatibility lists provided by manufacturers or enthusiast forums.

Another frequent challenge is the synchronization of software drivers. Each component in a mixed brand setup typically requires its own set of drivers to function optimally. However, these drivers may not always work seamlessly together if they come from different brands. Users must ensure that they are installing the latest driver versions and watch out for updates that might resolve existing conflicts or improve interoperability between components.

Heat management is another critical aspect when dealing with mixed brand systems. Different components may have varying thermal profiles and cooling requirements. A high-performance processor from one brand might generate more heat than the cooling solution designed for another brand's case can handle effectively, leading to throttling or even hardware damage over time. It's essential to invest in adequate cooling solutions that cater to the specific needs

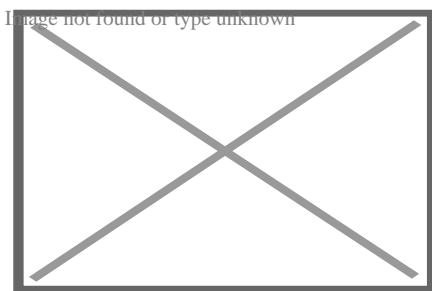
of each component within your setup.

Power supply considerations are equally important in ensuring uniform performance across mixed brand components. Each component has its own power consumption characteristics, and mismatched power delivery can lead to instability or poor performance. Users should calculate the total power requirement of their system and choose a power supply unit (PSU) that provides ample headroom beyond this baseline need, taking into account efficiency ratings like 80 PLUS certifications for optimal energy usage.

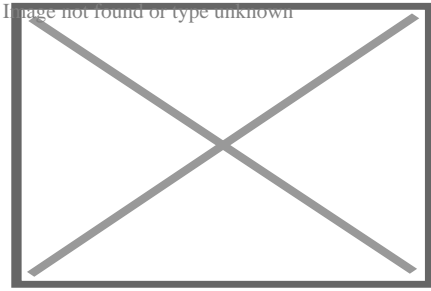
Network connectivity is yet another area where mixed brand setups might face hurdles. Routers from one manufacturer might not communicate as efficiently with network adapters or smart devices produced by another company due to differences in wireless protocols or firmware implementations. In such cases, updating firmware regularly and exploring third-party firmware options could enhance compatibility and improve overall network performance.

Ultimately, maintaining uniform performance in mixed brand setups demands vigilance and proactive measures from users who must navigate potential pitfalls associated with multiple vendors' technologies coexisting within a single ecosystem. By conducting thorough research on component compatibility prior to assembly; keeping software drivers up-to-date; managing heat dissipation effectively; ensuring sufficient power supply capacity; addressing network connectivity issues; conscientious builders can achieve harmonious operation among diverse hardware elements-unlocking new levels of creativity without sacrificing reliability along this journey toward technological synergy!

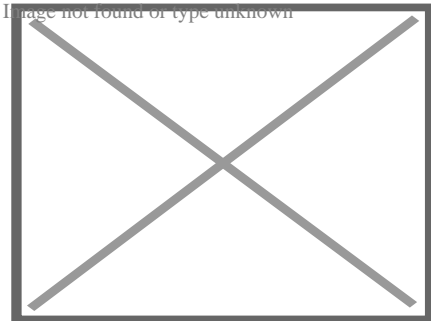
About Heating, ventilation, and air conditioning



Rooftop HVAC unit with view of fresh-air intake vent



Ventilation duct with outlet diffuser vent. These are installed throughout a building to move air in or out of rooms. In the middle is a damper to open and close the vent to allow more or less air to enter the space.



The control circuit in a household HVAC installation. The wires connecting to the blue terminal block on the upper-right of the board lead to the thermostat. The fan enclosure is directly behind the board, and the filters can be seen at the top. The safety interlock switch is at the bottom left. In the lower middle is the capacitor.

Heating, ventilation, and air conditioning (HVAC) is the use of various technologies to control the temperature, humidity, and purity of the air in an enclosed space. Its goal is to provide thermal comfort and acceptable indoor air quality. HVAC system design is a subdiscipline of mechanical engineering, based on the principles of thermodynamics, fluid mechanics, and heat transfer. "Refrigeration" is sometimes added to the field's abbreviation as **HVAC&R** or **HVACR**, or "ventilation" is dropped, as in **HACR** (as in the designation of HACR-rated circuit breakers).

HVAC is an important part of residential structures such as single family homes, apartment buildings, hotels, and senior living facilities; medium to large industrial and office buildings such as skyscrapers and hospitals; vehicles such as cars, trains, airplanes, ships and submarines; and in marine environments, where safe and healthy building conditions are regulated with respect to temperature and humidity, using fresh air from outdoors.

Ventilating or ventilation (the "V" in HVAC) is the process of exchanging or replacing air in any space to provide high indoor air quality which involves temperature control, oxygen replenishment, and removal of moisture, odors, smoke, heat, dust, airborne

bacteria, carbon dioxide, and other gases. Ventilation removes unpleasant smells and excessive moisture, introduces outside air, keeps interior building air circulating, and prevents stagnation of the interior air. Methods for ventilating a building are divided into *mechanical/forced* and *natural* types.[¹]

Overview

[edit]

The three major functions of heating, ventilation, and air conditioning are interrelated, especially with the need to provide thermal comfort and acceptable indoor air quality within reasonable installation, operation, and maintenance costs. HVAC systems can be used in both domestic and commercial environments. HVAC systems can provide ventilation, and maintain pressure relationships between spaces. The means of air delivery and removal from spaces is known as room air distribution.[²]

Individual systems

[edit]

See also: HVAC control system

In modern buildings, the design, installation, and control systems of these functions are integrated into one or more HVAC systems. For very small buildings, contractors normally estimate the capacity and type of system needed and then design the system, selecting the appropriate refrigerant and various components needed. For larger buildings, building service designers, mechanical engineers, or building services engineers analyze, design, and specify the HVAC systems. Specialty mechanical contractors and suppliers then fabricate, install and commission the systems. Building permits and code-compliance inspections of the installations are normally required for all sizes of buildings

District networks

[edit]

Although HVAC is executed in individual buildings or other enclosed spaces (like NORAD's underground headquarters), the equipment involved is in some cases an extension of a larger district heating (DH) or district cooling (DC) network, or a

combined DHC network. In such cases, the operating and maintenance aspects are simplified and metering becomes necessary to bill for the energy that is consumed, and in some cases energy that is returned to the larger system. For example, at a given time one building may be utilizing chilled water for air conditioning and the warm water it returns may be used in another building for heating, or for the overall heating-portion of the DHC network (likely with energy added to boost the temperature).^{[3][4][5]}

Basing HVAC on a larger network helps provide an economy of scale that is often not possible for individual buildings, for utilizing renewable energy sources such as solar heat,^{[6][7][8]} winter's cold,^{[9][10]} the cooling potential in some places of lakes or seawater for free cooling, and the enabling function of seasonal thermal energy storage. By utilizing natural sources that can be used for HVAC systems it can make a huge difference for the environment and help expand the knowledge of using different methods.

History

[edit]

See also: Air conditioning § History

HVAC is based on inventions and discoveries made by Nikolay Lvov, Michael Faraday, Rolla C. Carpenter, Willis Carrier, Edwin Ruud, Reuben Trane, James Joule, William Rankine, Sadi Carnot, Alice Parker and many others.^[11]

Multiple inventions within this time frame preceded the beginnings of the first comfort air conditioning system, which was designed in 1902 by Alfred Wolff (Cooper, 2003) for the New York Stock Exchange, while Willis Carrier equipped the Sacketts-Wilhems Printing Company with the process AC unit the same year. Coyne College was the first school to offer HVAC training in 1899.^[12] The first residential AC was installed by 1914, and by the 1950s there was "widespread adoption of residential AC".^[13]

The invention of the components of HVAC systems went hand-in-hand with the Industrial Revolution, and new methods of modernization, higher efficiency, and system control are constantly being introduced by companies and inventors worldwide.

Heating

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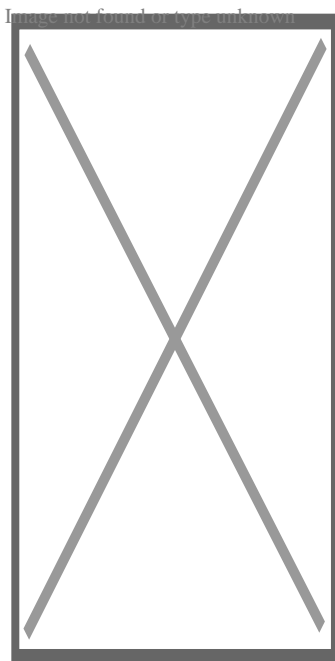
"Heater" redirects here. For other uses, see Heater (disambiguation).

Main article: Central heating

Heaters are appliances whose purpose is to generate heat (i.e. warmth) for the building. This can be done via central heating. Such a system contains a boiler, furnace, or heat pump to heat water, steam, or air in a central location such as a furnace room in a home, or a mechanical room in a large building. The heat can be transferred by convection, conduction, or radiation. Space heaters are used to heat single rooms and only consist of a single unit.

Generation

[edit]



Central heating unit

Heaters exist for various types of fuel, including solid fuels, liquids, and gases. Another type of heat source is electricity, normally heating ribbons composed of high resistance wire (see Nichrome). This principle is also used for baseboard heaters and portable heaters. Electrical heaters are often used as backup or supplemental heat for heat pump systems.

The heat pump gained popularity in the 1950s in Japan and the United States.^[14] Heat pumps can extract heat from various sources, such as environmental air, exhaust air from a building, or from the ground. Heat pumps transfer heat from outside the structure into the air inside. Initially, heat pump HVAC systems were only used in moderate climates, but with improvements in low temperature operation and reduced loads due to more efficient homes, they are increasing in popularity in cooler climates.

They can also operate in reverse to cool an interior.

Distribution

[edit]

Water/steam

[edit]

In the case of heated water or steam, piping is used to transport the heat to the rooms. Most modern hot water boiler heating systems have a circulator, which is a pump, to move hot water through the distribution system (as opposed to older gravity-fed systems). The heat can be transferred to the surrounding air using radiators, hot water coils (hydro-air), or other heat exchangers. The radiators may be mounted on walls or installed within the floor to produce floor heat.

The use of water as the heat transfer medium is known as hydronics. The heated water can also supply an auxiliary heat exchanger to supply hot water for bathing and washing.

Air

[edit]

Main articles: Room air distribution and Underfloor air distribution

Warm air systems distribute the heated air through ductwork systems of supply and return air through metal or fiberglass ducts. Many systems use the same ducts to distribute air cooled by an evaporator coil for air conditioning. The air supply is normally filtered through air filters^[*dubious – discuss*] to remove dust and pollen particles.^[15]

Dangers

[edit]

The use of furnaces, space heaters, and boilers as a method of indoor heating could result in incomplete combustion and the emission of carbon monoxide, nitrogen oxides, formaldehyde, volatile organic compounds, and other combustion byproducts. Incomplete combustion occurs when there is insufficient oxygen; the inputs are fuels containing various contaminants and the outputs are harmful byproducts, most dangerously carbon monoxide, which is a tasteless and odorless gas with serious adverse health effects.^[16]

Without proper ventilation, carbon monoxide can be lethal at concentrations of 1000 ppm (0.1%). However, at several hundred ppm, carbon monoxide exposure induces headaches, fatigue, nausea, and vomiting. Carbon monoxide binds with hemoglobin in the blood, forming carboxyhemoglobin, reducing the blood's ability to transport oxygen. The primary health concerns associated with carbon monoxide exposure are its cardiovascular and neurobehavioral effects. Carbon monoxide can cause atherosclerosis (the hardening of arteries) and can also trigger heart attacks. Neurologically, carbon monoxide exposure reduces hand to eye coordination, vigilance, and continuous performance. It can also affect time discrimination.^[17]

Ventilation

[edit]

Main article: Ventilation (architecture)

See also: Duct (flow)

Ventilation is the process of changing or replacing air in any space to control the temperature or remove any combination of moisture, odors, smoke, heat, dust, airborne bacteria, or carbon dioxide, and to replenish oxygen. It plays a critical role in maintaining a healthy indoor environment by preventing the buildup of harmful pollutants and ensuring the circulation of fresh air. Different methods, such as natural ventilation through windows and mechanical ventilation systems, can be used depending on the building design and air quality needs. Ventilation often refers to the intentional delivery of the outside air to the building indoor space. It is one of the most important factors for maintaining acceptable indoor air quality in buildings.

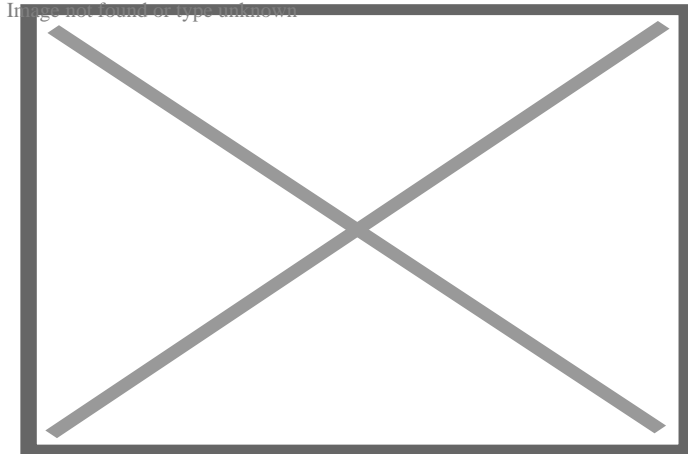
Although ventilation is an integral component of maintaining good indoor air quality, it may not be satisfactory alone.^[18] A clear understanding of both indoor and outdoor air quality parameters is needed to improve the performance of ventilation in terms of ...^[19] In scenarios where outdoor pollution would deteriorate indoor air quality, other treatment devices such as filtration may also be necessary.^[20]

Methods for ventilating a building may be divided into *mechanical/forced* and *natural* types.^[21]

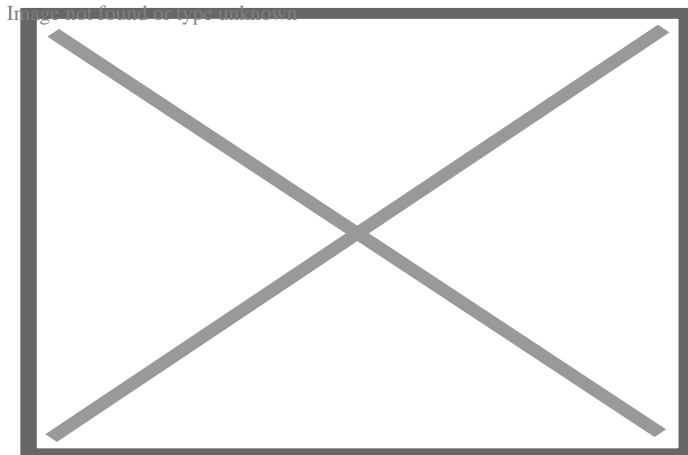
Mechanical or forced

[edit]

Further information: Ventilation (architecture) § Mechanical systems



HVAC ventilation exhaust for a 12-story building



An axial belt-drive exhaust fan serving an underground car park. This exhaust fan's operation is interlocked with the concentration of contaminants emitted by internal combustion engines.

Mechanical, or forced, ventilation is provided by an air handler (AHU) and used to control indoor air quality. Excess humidity, odors, and contaminants can often be controlled via dilution or replacement with outside air. However, in humid climates more energy is required to remove excess moisture from ventilation air.

Kitchens and bathrooms typically have mechanical exhausts to control odors and sometimes humidity. Factors in the design of such systems include the flow rate

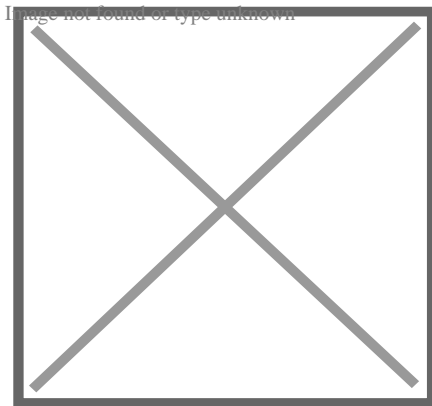
(which is a function of the fan speed and exhaust vent size) and noise level. Direct drive fans are available for many applications and can reduce maintenance needs.

In summer, ceiling fans and table/floor fans circulate air within a room for the purpose of reducing the perceived temperature by increasing evaporation of perspiration on the skin of the occupants. Because hot air rises, ceiling fans may be used to keep a room warmer in the winter by circulating the warm stratified air from the ceiling to the floor.

Passive

[edit]

Main article: Passive ventilation



Ventilation on the downdraught system, by impulsion, or the 'plenum' principle, applied to schoolrooms (1899)

Natural ventilation is the ventilation of a building with outside air without using fans or other mechanical systems. It can be via operable windows, louvers, or trickle vents when spaces are small and the architecture permits. ASHRAE defined Natural ventilation as the flow of air through open windows, doors, grilles, and other planned building envelope penetrations, and as being driven by natural and/or artificially produced pressure differentials.^[1]

Natural ventilation strategies also include cross ventilation, which relies on wind pressure differences on opposite sides of a building. By strategically placing openings, such as windows or vents, on opposing walls, air is channeled through the space to enhance cooling and ventilation. Cross ventilation is most effective when there are clear, unobstructed paths for airflow within the building.

In more complex schemes, warm air is allowed to rise and flow out high building openings to the outside (stack effect), causing cool outside air to be drawn into low

building openings. Natural ventilation schemes can use very little energy, but care must be taken to ensure comfort. In warm or humid climates, maintaining thermal comfort solely via natural ventilation might not be possible. Air conditioning systems are used, either as backups or supplements. Air-side economizers also use outside air to condition spaces, but do so using fans, ducts, dampers, and control systems to introduce and distribute cool outdoor air when appropriate.

An important component of natural ventilation is air change rate or air changes per hour: the hourly rate of ventilation divided by the volume of the space. For example, six air changes per hour means an amount of new air, equal to the volume of the space, is added every ten minutes. For human comfort, a minimum of four air changes per hour is typical, though warehouses might have only two. Too high of an air change rate may be uncomfortable, akin to a wind tunnel which has thousands of changes per hour. The highest air change rates are for crowded spaces, bars, night clubs, commercial kitchens at around 30 to 50 air changes per hour.^[22]

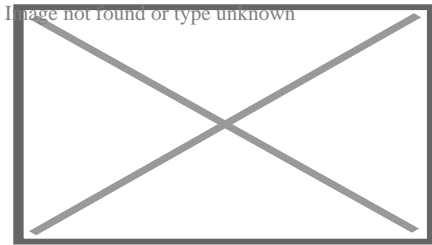
Room pressure can be either positive or negative with respect to outside the room. Positive pressure occurs when there is more air being supplied than exhausted, and is common to reduce the infiltration of outside contaminants.^[23]

Airborne diseases

[edit]

Natural ventilation ^[24] is a key factor in reducing the spread of airborne illnesses such as tuberculosis, the common cold, influenza, meningitis or COVID-19. Opening doors and windows are good ways to maximize natural ventilation, which would make the risk of airborne contagion much lower than with costly and maintenance-requiring mechanical systems. Old-fashioned clinical areas with high ceilings and large windows provide the greatest protection. Natural ventilation costs little and is maintenance free, and is particularly suited to limited-resource settings and tropical climates, where the burden of TB and institutional TB transmission is highest. In settings where respiratory isolation is difficult and climate permits, windows and doors should be opened to reduce the risk of airborne contagion. Natural ventilation requires little maintenance and is inexpensive.^[25]

Natural ventilation is not practical in much of the infrastructure because of climate. This means that the facilities need to have effective mechanical ventilation systems and or use Ceiling Level UV or FAR UV ventilation systems.



Alpha Black Edition - Sirair Air conditioner with UVC (Ultraviolet Germicidal Irradiation)

Ventilation is measured in terms of Air Changes Per Hour (ACH). As of 2023, the CDC recommends that all spaces have a minimum of 5 ACH.^[26] For hospital rooms with airborne contagions the CDC recommends a minimum of 12 ACH.^[27] The challenges in facility ventilation are public unawareness,^[28]^[29] ineffective government oversight, poor building codes that are based on comfort levels, poor system operations, poor maintenance, and lack of transparency.^[30]

UVC or Ultraviolet Germicidal Irradiation is a function used in modern air conditioners which reduces airborne viruses, bacteria, and fungi, through the use of a built-in LED UV light that emits a gentle glow across the evaporator. As the cross-flow fan circulates the room air, any viruses are guided through the sterilization module's irradiation range, rendering them instantly inactive.^[31]

Air conditioning

[edit]

Main article: Air conditioning

An air conditioning system, or a standalone air conditioner, provides cooling and/or humidity control for all or part of a building. Air conditioned buildings often have sealed windows, because open windows would work against the system intended to maintain constant indoor air conditions. Outside, fresh air is generally drawn into the system by a vent into a mix air chamber for mixing with the space return air. Then the mixture air enters an indoor or outdoor heat exchanger section where the air is to be cooled down, then be guided to the space creating positive air pressure. The percentage of return air made up of fresh air can usually be manipulated by adjusting the opening of this vent. Typical fresh air intake is about 10% of the total supply air.^[*citation needed*]

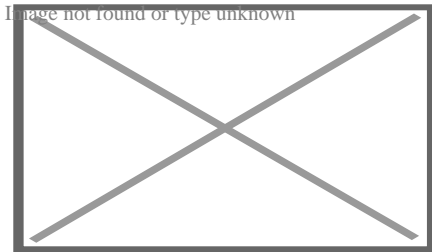
Air conditioning and refrigeration are provided through the removal of heat. Heat can be removed through radiation, convection, or conduction. The heat transfer medium is a refrigeration system, such as water, air, ice, and chemicals are referred to as refrigerants. A refrigerant is employed either in a heat pump system in which a compressor is used to drive thermodynamic refrigeration cycle, or in a free cooling system that uses pumps to circulate a cool refrigerant (typically water or a glycol mix).

It is imperative that the air conditioning horsepower is sufficient for the area being cooled. Underpowered air conditioning systems will lead to power wastage and inefficient usage. Adequate horsepower is required for any air conditioner installed.

Refrigeration cycle

[edit]

Main article: Heat pump and refrigeration cycle



A simple stylized diagram of the refrigeration cycle: 1) condensing coil, 2) expansion valve, 3) evaporating coil, 4) compressor

The refrigeration cycle uses four essential elements to cool, which are compressor, condenser, metering device, and evaporator.

- At the inlet of a compressor, the refrigerant inside the system is in a low pressure, low temperature, gaseous state. The **compressor** pumps the refrigerant gas up to high pressure and temperature.
- From there it enters a heat exchanger (sometimes called a **condensing coil** or condenser) where it loses heat to the outside, cools, and condenses into its liquid phase.
- An **expansion valve** (also called metering device) regulates the refrigerant liquid to flow at the proper rate.
- The liquid refrigerant is returned to another heat exchanger where it is allowed to evaporate, hence the heat exchanger is often called an **evaporating coil** or evaporator. As the liquid refrigerant evaporates it absorbs heat from the inside air, returns to the compressor, and repeats the cycle. In the process, heat is absorbed from indoors and transferred outdoors, resulting in cooling of the building.

In variable climates, the system may include a reversing valve that switches from heating in winter to cooling in summer. By reversing the flow of refrigerant, the heat pump refrigeration cycle is changed from cooling to heating or vice versa. This allows a facility to be heated and cooled by a single piece of equipment by the same means,

and with the same hardware.

Free cooling

[edit]

Main article: Free cooling

Free cooling systems can have very high efficiencies, and are sometimes combined with seasonal thermal energy storage so that the cold of winter can be used for summer air conditioning. Common storage mediums are deep aquifers or a natural underground rock mass accessed via a cluster of small-diameter, heat-exchanger-equipped boreholes. Some systems with small storages are hybrids, using free cooling early in the cooling season, and later employing a heat pump to chill the circulation coming from the storage. The heat pump is added-in because the storage acts as a heat sink when the system is in cooling (as opposed to charging) mode, causing the temperature to gradually increase during the cooling season.

Some systems include an "economizer mode", which is sometimes called a "free-cooling mode". When economizing, the control system will open (fully or partially) the outside air damper and close (fully or partially) the return air damper. This will cause fresh, outside air to be supplied to the system. When the outside air is cooler than the demanded cool air, this will allow the demand to be met without using the mechanical supply of cooling (typically chilled water or a direct expansion "DX" unit), thus saving energy. The control system can compare the temperature of the outside air vs. return air, or it can compare the enthalpy of the air, as is frequently done in climates where humidity is more of an issue. In both cases, the outside air must be less energetic than the return air for the system to enter the economizer mode.

Packaged split system

[edit]

Central, "all-air" air-conditioning systems (or package systems) with a combined outdoor condenser/evaporator unit are often installed in North American residences, offices, and public buildings, but are difficult to retrofit (install in a building that was not designed to receive it) because of the bulky air ducts required.^[32] (Minisplit ductless systems are used in these situations.) Outside of North America, packaged systems are only used in limited applications involving large indoor space such as stadiums,

theatres or exhibition halls.

An alternative to packaged systems is the use of separate indoor and outdoor coils in split systems. Split systems are preferred and widely used worldwide except in North America. In North America, split systems are most often seen in residential applications, but they are gaining popularity in small commercial buildings. Split systems are used where ductwork is not feasible or where the space conditioning efficiency is of prime concern.^[33] The benefits of ductless air conditioning systems include easy installation, no ductwork, greater zonal control, flexibility of control, and quiet operation.^[34] In space conditioning, the duct losses can account for 30% of energy consumption.^[35] The use of minisplits can result in energy savings in space conditioning as there are no losses associated with ducting.

With the split system, the evaporator coil is connected to a remote condenser unit using refrigerant piping between an indoor and outdoor unit instead of ducting air directly from the outdoor unit. Indoor units with directional vents mount onto walls, suspended from ceilings, or fit into the ceiling. Other indoor units mount inside the ceiling cavity so that short lengths of duct handle air from the indoor unit to vents or diffusers around the rooms.

Split systems are more efficient and the footprint is typically smaller than the package systems. On the other hand, package systems tend to have a slightly lower indoor noise level compared to split systems since the fan motor is located outside.

Dehumidification

[edit]

Dehumidification (air drying) in an air conditioning system is provided by the evaporator. Since the evaporator operates at a temperature below the dew point, moisture in the air condenses on the evaporator coil tubes. This moisture is collected at the bottom of the evaporator in a pan and removed by piping to a central drain or onto the ground outside.

A dehumidifier is an air-conditioner-like device that controls the humidity of a room or building. It is often employed in basements that have a higher relative humidity because of their lower temperature (and propensity for damp floors and walls). In food retailing establishments, large open chiller cabinets are highly effective at dehumidifying the internal air. Conversely, a humidifier increases the humidity of a building.

The HVAC components that dehumidify the ventilation air deserve careful attention because outdoor air constitutes most of the annual humidity load for nearly all buildings.^[36]

Humidification

[edit]

Main article: Humidifier

Maintenance

[edit]

All modern air conditioning systems, even small window package units, are equipped with internal air filters.^[*citation needed*] These are generally of a lightweight gauze-like material, and must be replaced or washed as conditions warrant. For example, a building in a high dust environment, or a home with furry pets, will need to have the filters changed more often than buildings without these dirt loads. Failure to replace these filters as needed will contribute to a lower heat exchange rate, resulting in wasted energy, shortened equipment life, and higher energy bills; low air flow can result in iced-over evaporator coils, which can completely stop airflow. Additionally, very dirty or plugged filters can cause overheating during a heating cycle, which can result in damage to the system or even fire.

Because an air conditioner moves heat between the indoor coil and the outdoor coil, both must be kept clean. This means that, in addition to replacing the air filter at the evaporator coil, it is also necessary to regularly clean the condenser coil. Failure to keep the condenser clean will eventually result in harm to the compressor because the condenser coil is responsible for discharging both the indoor heat (as picked up by the evaporator) and the heat generated by the electric motor driving the compressor.

Energy efficiency

[edit]

HVAC is significantly responsible for promoting energy efficiency of buildings as the building sector consumes the largest percentage of global energy.^[37] Since the 1980s, manufacturers of HVAC equipment have been making an effort to make the systems they manufacture more efficient. This was originally driven by rising energy

costs, and has more recently been driven by increased awareness of environmental issues. Additionally, improvements to the HVAC system efficiency can also help increase occupant health and productivity.^[38] In the US, the EPA has imposed tighter restrictions over the years. There are several methods for making HVAC systems more efficient.

Heating energy

[edit]

In the past, water heating was more efficient for heating buildings and was the standard in the United States. Today, forced air systems can double for air conditioning and are more popular.

Some benefits of forced air systems, which are now widely used in churches, schools, and high-end residences, are

- Better air conditioning effects
- Energy savings of up to 15–20%
- Even conditioning^[citation needed]

A drawback is the installation cost, which can be slightly higher than traditional HVAC systems.

Energy efficiency can be improved even more in central heating systems by introducing zoned heating. This allows a more granular application of heat, similar to non-central heating systems. Zones are controlled by multiple thermostats. In water heating systems the thermostats control zone valves, and in forced air systems they control zone dampers inside the vents which selectively block the flow of air. In this case, the control system is very critical to maintaining a proper temperature.

Forecasting is another method of controlling building heating by calculating the demand for heating energy that should be supplied to the building in each time unit.

Ground source heat pump

[edit]

Main article: Geothermal heat pump

Ground source, or geothermal, heat pumps are similar to ordinary heat pumps, but instead of transferring heat to or from outside air, they rely on the stable, even temperature of the earth to provide heating and air conditioning. Many regions experience seasonal temperature extremes, which would require large-capacity heating and cooling equipment to heat or cool buildings. For example, a conventional heat pump system used to heat a building in Montana's -57 °C (-70 °F) low temperature or cool a building in the highest temperature ever recorded in the US— 57 °C (134 °F) in Death Valley, California, in 1913 would require a large amount of energy due to the extreme difference between inside and outside air temperatures. A metre below the earth's surface, however, the ground remains at a relatively constant temperature. Utilizing this large source of relatively moderate temperature earth, a heating or cooling system's capacity can often be significantly reduced. Although ground temperatures vary according to latitude, at 1.8 metres (6 ft) underground, temperatures generally only range from $7\text{ to }24\text{ °C}$ ($45\text{ to }75\text{ °F}$).

Solar air conditioning

[edit]

Main article: Solar air conditioning

Photovoltaic solar panels offer a new way to potentially decrease the operating cost of air conditioning. Traditional air conditioners run using alternating current, and hence, any direct-current solar power needs to be inverted to be compatible with these units. New variable-speed DC-motor units allow solar power to more easily run them since this conversion is unnecessary, and since the motors are tolerant of voltage fluctuations associated with variance in supplied solar power (e.g., due to cloud cover).

Ventilation energy recovery

[edit]

Energy recovery systems sometimes utilize heat recovery ventilation or energy recovery ventilation systems that employ heat exchangers or enthalpy wheels to recover sensible or latent heat from exhausted air. This is done by transfer of energy from the stale air inside the home to the incoming fresh air from outside.

Air conditioning energy

[edit]

The performance of vapor compression refrigeration cycles is limited by thermodynamics.^[39] These air conditioning and heat pump devices *move* heat rather than convert it from one form to another, so *thermal efficiencies* do not appropriately describe the performance of these devices. The Coefficient of performance (COP) measures performance, but this dimensionless measure has not been adopted. Instead, the Energy Efficiency Ratio (*EER*) has traditionally been used to characterize the performance of many HVAC systems. EER is the Energy Efficiency Ratio based on a 35 °C (95 °F) outdoor temperature. To more accurately describe the performance of air conditioning equipment over a typical cooling season a modified version of the EER, the Seasonal Energy Efficiency Ratio (*SEER*), or in Europe the ESEER, is used. SEER ratings are based on seasonal temperature averages instead of a constant 35 °C (95 °F) outdoor temperature. The current industry minimum SEER rating is 14 SEER. Engineers have pointed out some areas where efficiency of the existing hardware could be improved. For example, the fan blades used to move the air are usually stamped from sheet metal, an economical method of manufacture, but as a result they are not aerodynamically efficient. A well-designed blade could reduce the electrical power required to move the air by a third.^[40]

Demand-controlled kitchen ventilation

[edit]

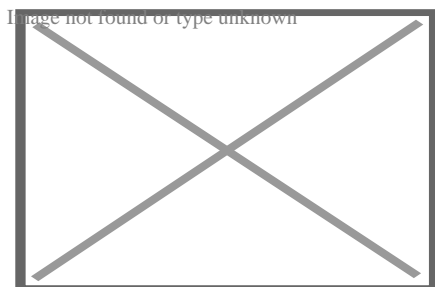
Main article: Demand controlled ventilation

Demand-controlled kitchen ventilation (DCKV) is a building controls approach to controlling the volume of kitchen exhaust and supply air in response to the actual cooking loads in a commercial kitchen. Traditional commercial kitchen ventilation systems operate at 100% fan speed independent of the volume of cooking activity and DCKV technology changes that to provide significant fan energy and conditioned air savings. By deploying smart sensing technology, both the exhaust and supply fans can be controlled to capitalize on the affinity laws for motor energy savings, reduce makeup air heating and cooling energy, increasing safety, and reducing ambient kitchen noise levels.^[41]

Air filtration and cleaning

[edit]

Main article: Air filter



Air handling unit, used for heating, cooling, and filtering the air

Air cleaning and filtration removes particles, contaminants, vapors and gases from the air. The filtered and cleaned air then is used in heating, ventilation, and air conditioning. Air cleaning and filtration should be taken in account when protecting our building environments.^[42] If present, contaminants can come out from the HVAC systems if not removed or filtered properly.

Clean air delivery rate (CADR) is the amount of clean air an air cleaner provides to a room or space. When determining CADR, the amount of airflow in a space is taken into account. For example, an air cleaner with a flow rate of 30 cubic metres (1,000 cu ft) per minute and an efficiency of 50% has a CADR of 15 cubic metres (500 cu ft) per minute. Along with CADR, filtration performance is very important when it comes to the air in our indoor environment. This depends on the size of the particle or fiber, the filter packing density and depth, and the airflow rate.^[42]

Circulation of harmful substances

[edit]

[icon] **This section needs expansion.** You can help by adding to it. *(October 2024)*

Poorly maintained air conditioners/ventilation systems can harbor mold, bacteria, and other contaminants, which are then circulated throughout indoor spaces, contributing to ...^[43]

Industry and standards

[edit]

The HVAC industry is a worldwide enterprise, with roles including operation and maintenance, system design and construction, equipment manufacturing and sales, and in education and research. The HVAC industry was historically regulated by the manufacturers of HVAC equipment, but regulating and standards organizations such as HARDI (Heating, Air-conditioning and Refrigeration Distributors International), ASHRAE, SMACNA, ACCA (Air Conditioning Contractors of America), Uniform Mechanical Code, International Mechanical Code, and AMCA have been established to support the industry and encourage high standards and achievement. (UL as an omnibus agency is not specific to the HVAC industry.)

The starting point in carrying out an estimate both for cooling and heating depends on the exterior climate and interior specified conditions. However, before taking up the heat load calculation, it is necessary to find fresh air requirements for each area in detail, as pressurization is an important consideration.

International

[edit]

ISO 16813:2006 is one of the ISO building environment standards.^[44] It establishes the general principles of building environment design. It takes into account the need to provide a healthy indoor environment for the occupants as well as the need to protect the environment for future generations and promote collaboration among the various parties involved in building environmental design for sustainability. ISO16813 is applicable to new construction and the retrofit of existing buildings.^[45]

The building environmental design standard aims to:^[45]

- provide the constraints concerning sustainability issues from the initial stage of the design process, with building and plant life cycle to be considered together with owning and operating costs from the beginning of the design process;
- assess the proposed design with rational criteria for indoor air quality, thermal comfort, acoustical comfort, visual comfort, energy efficiency, and HVAC system controls at every stage of the design process;
- iterate decisions and evaluations of the design throughout the design process.

United States

[edit]

Licensing

[edit]

Main article: Section 608 EPA Certification

In the United States, federal licensure is generally handled by EPA certified (for installation and service of HVAC devices).

Many U.S. states have licensing for boiler operation. Some of these are listed as follows:

- Arkansas ^[46]
- Georgia ^[47]
- Michigan ^[48]
- Minnesota ^[49]
- Montana ^[50]
- New Jersey ^[51]
- North Dakota ^[52]
- Ohio ^[53]
- Oklahoma ^[54]
- Oregon ^[55]

Finally, some U.S. cities may have additional labor laws that apply to HVAC professionals.

Societies

[edit]

See also: American Society of Heating, Refrigerating and Air-Conditioning Engineers

See also: Air Conditioning, Heating and Refrigeration Institute

Many HVAC engineers are members of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). ASHRAE regularly organizes two annual technical committees and publishes recognized standards for HVAC design, which are updated every four years.^[56]

Another popular society is AHRI, which provides regular information on new refrigeration technology, and publishes relevant standards and codes.

Codes

[edit]

Codes such as the UMC and IMC do include much detail on installation requirements, however. Other useful reference materials include items from SMACNA, ACGIH, and technical trade journals.

American design standards are legislated in the Uniform Mechanical Code or International Mechanical Code. In certain states, counties, or cities, either of these codes may be adopted and amended via various legislative processes. These codes are updated and published by the International Association of Plumbing and Mechanical Officials (IAPMO) or the International Code Council (ICC) respectively, on a 3-year code development cycle. Typically, local building permit departments are charged with enforcement of these standards on private and certain public properties.

Technicians

[edit]

HVAC Technician

Occupation

Occupation type Vocational

Activity sectors Construction

Description

Education required Apprenticeship

Related jobs Carpenter, electrician, plumber, welder

An **HVAC technician** is a tradesman who specializes in heating, ventilation, air conditioning, and refrigeration. HVAC technicians in the US can receive training through formal training institutions, where most earn associate degrees. Training for HVAC technicians includes classroom lectures and hands-on tasks, and can be followed by an apprenticeship wherein the recent graduate works alongside a professional HVAC technician for a temporary period.^[57] HVAC techs who have been trained can also be certified in areas such as air conditioning, heat pumps, gas heating, and commercial refrigeration.

United Kingdom

[edit]

The Chartered Institution of Building Services Engineers is a body that covers the essential Service (systems architecture) that allow buildings to operate. It includes the electrotechnical, heating, ventilating, air conditioning, refrigeration and plumbing industries. To train as a building services engineer, the academic requirements are GCSEs (A-C) / Standard Grades (1-3) in Maths and Science, which are important in measurements, planning and theory. Employers will often want a degree in a branch of engineering, such as building environment engineering, electrical engineering or mechanical engineering. To become a full member of CIBSE, and so also to be registered by the Engineering Council UK as a chartered engineer, engineers must also attain an Honours Degree and a master's degree in a relevant engineering subject.^[*citation needed*] CIBSE publishes several guides to HVAC design relevant to the UK market, and also the Republic of Ireland, Australia, New Zealand and Hong Kong. These guides include various recommended design criteria and standards, some of which are cited within the UK building regulations, and therefore form a legislative requirement for major building services works. The main guides are:

- Guide A: Environmental Design
- Guide B: Heating, Ventilating, Air Conditioning and Refrigeration
- Guide C: Reference Data
- Guide D: Transportation systems in Buildings
- Guide E: Fire Safety Engineering
- Guide F: Energy Efficiency in Buildings
- Guide G: Public Health Engineering
- Guide H: Building Control Systems
- Guide J: Weather, Solar and Illuminance Data
- Guide K: Electricity in Buildings
- Guide L: Sustainability
- Guide M: Maintenance Engineering and Management

Within the construction sector, it is the job of the building services engineer to design and oversee the installation and maintenance of the essential services such as gas, electricity, water, heating and lighting, as well as many others. These all help to make buildings comfortable and healthy places to live and work in. Building Services is part of a sector that has over 51,000 businesses and employs represents 2–3% of the GDP.

Australia

[edit]

The Air Conditioning and Mechanical Contractors Association of Australia (AMCA), Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH), Australian Refrigeration Mechanical Association and CIBSE are responsible.

Asia

[edit]

Asian architectural temperature-control have different priorities than European methods. For example, Asian heating traditionally focuses on maintaining temperatures of objects such as the floor or furnishings such as Kotatsu tables and directly warming people, as opposed to the Western focus, in modern periods, on designing air systems.

Philippines

[edit]

The Philippine Society of Ventilating, Air Conditioning and Refrigerating Engineers (PSVARE) along with Philippine Society of Mechanical Engineers (PSME) govern on the codes and standards for HVAC / MVAC (MVAC means "mechanical ventilation and air conditioning") in the Philippines.

India

[edit]

The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) was established to promote the HVAC industry in India. ISHRAE is an associate of ASHRAE. ISHRAE was founded at New Delhi^[58] in 1981 and a chapter was started in Bangalore in 1989. Between 1989 & 1993, ISHRAE chapters were formed in all major cities in India.^[*citation needed*]

See also

[edit]

- Air speed (HVAC)
- Architectural engineering
- ASHRAE Handbook
- Auxiliary power unit
- Cleanroom
- Electric heating
- Fan coil unit
- Glossary of HVAC terms
- Head-end power
- Hotel electric power
- Mechanical engineering
- Outdoor wood-fired boiler
- Radiant cooling
- Sick building syndrome
- Uniform Codes
- Uniform Mechanical Code
- Ventilation (architecture)
- World Refrigeration Day
- Wrightsoft

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57. ^ *"Heating, Air Conditioning, and Refrigeration Mechanics and Installers : Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics"*. www.bls.gov . Retrieved 2023-06-22.
58. ^ *"About ISHRAE"*. ISHRAE. Retrieved 2021-10-11.


Further reading

[edit]

- *International Mechanical Code* (2012 (Second Printing)) by the International Code Council, Thomson Delmar Learning.
- *Modern Refrigeration and Air Conditioning* (August 2003) by Althouse, Turnquist, and Bracciano, Goodheart-Wilcox Publisher; 18th edition.
- *The Cost of Cool*.
- *Whai is LEV?*

External links

[edit]

-  [Media related to Climate control at Wikimedia Commons](#)
- v
- t
- e

Heating, ventilation, and air conditioning

**Fundamental
concepts**

- Air changes per hour
- Bake-out
- Building envelope
- Convection
- Dilution
- Domestic energy consumption
- Enthalpy
- Fluid dynamics
- Gas compressor
- Heat pump and refrigeration cycle
- Heat transfer
- Humidity
- Infiltration
- Latent heat
- Noise control
- Outgassing
- Particulates
- Psychrometrics
- Sensible heat
- Stack effect
- Thermal comfort
- Thermal destratification
- Thermal mass
- Thermodynamics
- Vapour pressure of water

- Absorption-compression heat pump
- Absorption refrigerator
- Air barrier
- Air conditioning
- Antifreeze
- Automobile air conditioning
- Autonomous building
- Building insulation materials
- Central heating
- Central solar heating
- Chilled beam
- Chilled water
- Constant air volume (CAV)
- Coolant
- Cross ventilation
- Dedicated outdoor air system (DOAS)
- Deep water source cooling
- Demand controlled ventilation (DCV)
- Displacement ventilation
- District cooling
- District heating
- Electric heating
- Energy recovery ventilation (ERV)
- Firestop
- Forced-air
- Forced-air gas
- Free cooling
- Heat recovery ventilation (HRV)
- Hybrid heat
- Hydronics
- Ice storage air conditioning
- Kitchen ventilation
- Mixed-mode ventilation
- Microgeneration
- Passive cooling
- Passive daytime radiative cooling
- Passive house
- Passive ventilation
- Radiant heating and cooling
- Radiant cooling
- Radiant heating
- Radon mitigation
- Refrigeration
- Renewable heat
- Room air distribution
- Solar air heat
- Solar combisystem

Technology

- Air conditioner inverter
- Air door
- Air filter
- Air handler
- Air ionizer
- Air-mixing plenum
- Air purifier
- Air source heat pump
- Attic fan
- Automatic balancing valve
- Back boiler
- Barrier pipe
- Blast damper
- Boiler
- Centrifugal fan
- Ceramic heater
- Chiller
- Condensate pump
- Condenser
- Condensing boiler
- Convection heater
- Compressor
- Cooling tower
- Damper
- Dehumidifier
- Duct
- Economizer
- Electrostatic precipitator
- Evaporative cooler
- Evaporator
- Exhaust hood
- Expansion tank
- Fan
- Fan coil unit
- Fan filter unit
- Fan heater
- Fire damper
- Fireplace
- Fireplace insert
- Freeze stat
- Flue
- Freon
- Fume hood
- Furnace
- Gas compressor
- Gas heater
- Gasoline heater

**Measurement
and control**

- Air flow meter
- Aquastat
- BACnet
- Blower door
- Building automation
- Carbon dioxide sensor
- Clean air delivery rate (CADR)
- Control valve
- Gas detector
- Home energy monitor
- Humidistat
- HVAC control system
- Infrared thermometer
- Intelligent buildings
- LonWorks
- Minimum efficiency reporting value (MERV)
- Normal temperature and pressure (NTP)
- OpenTherm
- Programmable communicating thermostat
- Programmable thermostat
- Psychrometrics
- Room temperature
- Smart thermostat
- Standard temperature and pressure (STP)
- Thermographic camera
- Thermostat
- Thermostatic radiator valve
- Architectural acoustics
- Architectural engineering
- Architectural technologist
- Building services engineering
- Building information modeling (BIM)
- Deep energy retrofit
- Duct cleaning
- Duct leakage testing
- Environmental engineering
- Hydronic balancing
- Kitchen exhaust cleaning
- Mechanical engineering
- Mechanical, electrical, and plumbing
- Mold growth, assessment, and remediation
- Refrigerant reclamation
- Testing, adjusting, balancing

**Professions,
trades,
and services**

Industry organizations

- AHRI
- AMCA
- ASHRAE
- ASTM International
- BRE
- BSRIA
- CIBSE
- Institute of Refrigeration
- IIR
- LEED
- SMACNA
- UMC
- Indoor air quality (IAQ)
- Passive smoking
- Sick building syndrome (SBS)
- Volatile organic compound (VOC)
- ASHRAE Handbook
- Building science
- Fireproofing
- Glossary of HVAC terms
- Warm Spaces
- World Refrigeration Day
- Template:Home automation
- Template:Solar energy

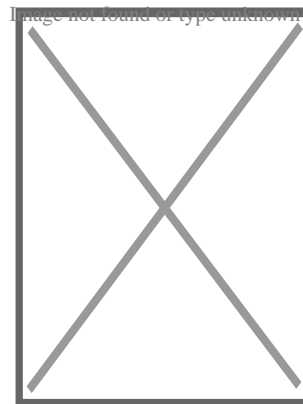
Health and safety

See also

- v
- t
- e

Home automation

Elements		<ul style="list-style-type: none"> ○ Actuators ○ Hardware controllers ○ Sensors
	Wired	<ul style="list-style-type: none"> ○ Cable (xDSL) ○ Optical fiber ○ Powerline <ul style="list-style-type: none"> ○ PLCBUS ○ Universal powerline bus (UPB) ○ X10 ○ Radio frequency <ul style="list-style-type: none"> ○ Bluetooth ○ Bluetooth Low Energy ○ DECT ○ EnOcean ○ GPRS ○ MyriNet ○ One-Net ○ Thread ○ UMTS ○ Wi-Fi ○ Zigbee ○ Z-Wave
Interconnection type	Wireless	
	Both	<ul style="list-style-type: none"> ○ Infrared (Consumer IR) ○ Insteon ○ KNX ○ Matter
System		
	Device interconnection	<ul style="list-style-type: none"> ○ Bluetooth ○ Bluetooth Low Energy ○ FireWire ○ IrDA ○ USB ○ Zigbee ○ AllJoyn ○ Bus SCS with OpenWebNet ○ C-Bus (protocol) ○ CEBus ○ EnOcean
Network		



- Audio and video
- Heating, ventilation, and air conditioning
- Lighting control system
- Other systems
- Tasks**
 - Robotics
 - Security
 - Thermostat automation
 - Gateway
 - Smart home hub
 - Costs
- Other**
 - Mesh networking
 - Organizations
 - Smart grid

See also

Home of the future
Building automation
Floor plan
Home automation
Home energy monitor
Home network
Home server
House navigation system
INTEGER Millennium House
The House for the Future
Ubiquitous computing
Xanadu Houses

Authority control databases: National  [Edit this at Wikidata](#)

About Oklahoma City

For other uses, see Oklahoma City (disambiguation).

Oklahoma City is located in the United States

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Oklahoma City

Oklahoma

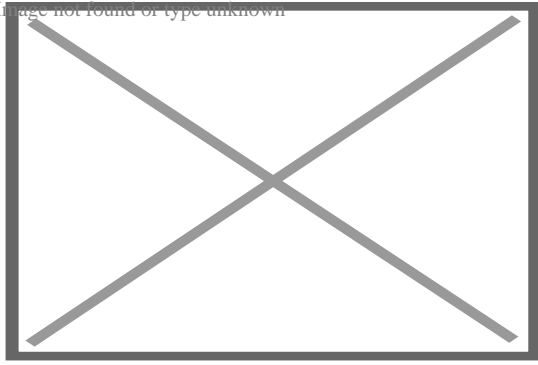
City

Location within the United
States

Oklahoma City

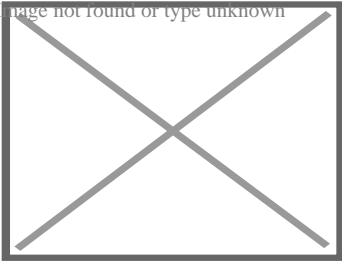
State capital city

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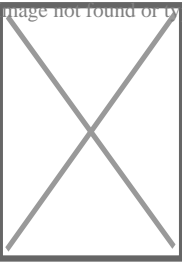
Downtown Oklahoma City

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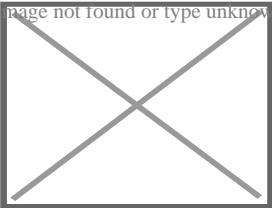
Oklahoma City Hall

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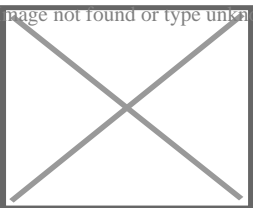
Skydance
Bridge

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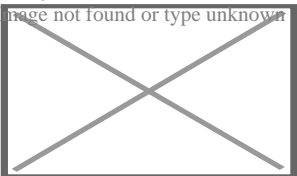
Oklahoma City
National Memorial

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Oklahoma State
Capitol

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Paycom Center

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Flag of Oklahoma City

Image not found or type unknown

Flag

Official seal of Oklahoma City

Image not found or type unknown

Seal

Nickname(s):

"OKC", "The 405", "Oklas", "Boomtown", "The Big Friendly",^[1] "The City",^[2]

Map

Image not found or type unknown

Interactive map of Oklahoma City

Oklahoma City is located in Oklahoma

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Oklahoma City

City

Location within the state of

Oklahoma

Coordinates: 35°28′7″N 97°31′17″W﻿ / ﻿35.46861°N 97.52139°W﻿ / 35.46861; -97.52139
Country United States State Oklahoma Counties

- Oklahoma

- Canadian
- Cleveland
- Pottawatomie

Founded April 22, 1889^[3] Incorporated July 15, 1890^[3] Government

• Type Council–manager • Body Oklahoma City Council • Mayor David Holt (R) • City manager Craig Freeman Area

^[4]

- City

620.79 sq mi (1,607.83 km²) • Land 606.48 sq mi (1,570.77 km²) • Water 14.31 sq mi (37.06 km²) • Urban

421.73 sq mi (1,092.3 km²) Elevation

^[5]

1,198 ft (365 m) Population

(2020)

- City

681,054 • Rank 62nd in North America

20th in the United States

1st in Oklahoma • Density 1,122.96/sq mi (433.58/km²) • Urban

982,276 (US: 46th) • Urban density 2,329.2/sq mi (899.3/km²) • Metro

^[6]

1,441,695 (US: 42nd)

- Oklahoma Cityan
- Oklahoma Citian

Demonyms

GDP

died,^[13] the deadliest terror attack in U.S. history until the attacks of September 11, 2001, and the deadliest act of domestic terrorism in U.S. history.

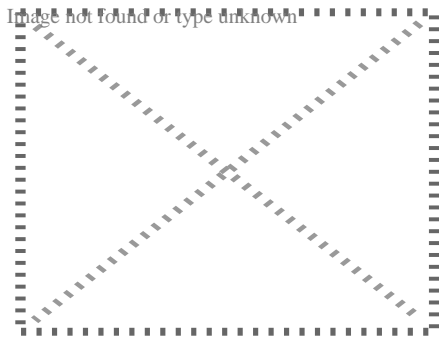
Since weather records have been kept beginning in 1890, Oklahoma City has been struck by 14 violent tornadoes, 11 of which were rated F4 or EF4 on the Fujita and Enhanced Fujita scales, and two rated F5 and EF5.^[14]

History

[edit]

Main article: History of Oklahoma City

For a chronological guide, see Timeline of Oklahoma City.



Map of Indian Territory (Oklahoma) 1889, showing Oklahoma as a train stop on a railroad line. Britannica 9th ed.

Native American names for Oklahoma City

Choctaw: *TãfÅ ãçâ, -ã¹maha chito Oklahumma*

Cherokee:

ãfã;ã...ã½ã,ã£ãfã;ã...ã½ã,ã!ãfã;ã...ã½ã,ã³ãfã;ã...ã½ã,ã°ãfã;ã...ã½ã,ã¹ãfã;ã...ã½ã,ã!ãfã;ã,ã•ã...ã;ãfã;ã...ã½ã,ã²ãfã;ã...ã½ã,ãç

Romanized: ogalahoma gaduhvi

Cheyenne: *Ma'xepóno'e*

Comanche: *Pia SookaãfÅ'ã,ã hni*

Delaware: *Oklahoma-utènaii*

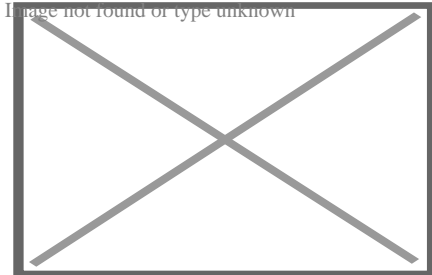
Iowa-Oto: *Chína Chége Itúãfãçã,ã•ã,ã¸^[15]*

Navajo: *Halgai Hóteeldi Kin HaalãfÅ ã,ã¼áhí*

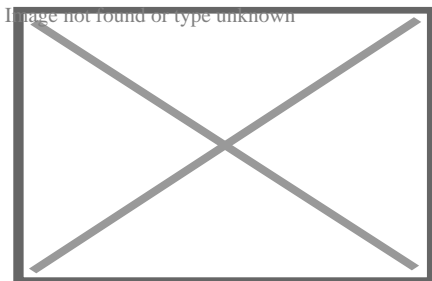
Meskwaki: *Okonohômîheki^[16]*

Oklahoma City was settled on April 22, 1889,^[17] when the area known as the "Unassigned Lands" was opened for settlement in an event known as "The Land

Run".^[18] On April 26 of that year, its first mayor was elected, William Couch. Some 10,000 homesteaders settled in the area that would become the capital of Oklahoma. The town grew quickly; the population doubled between 1890 and 1900.^[19] Early leaders of the development of the city included Anton H. Classen, John Wilford Shartel, Henry Overholser, Oscar Ameringer, Jack C. Walton, Angelo C. Scott, and James W. Maney.



Lithograph of Oklahoma City from 1890.



Looking north on Broadway from present-day Sheridan Ave, 1910.

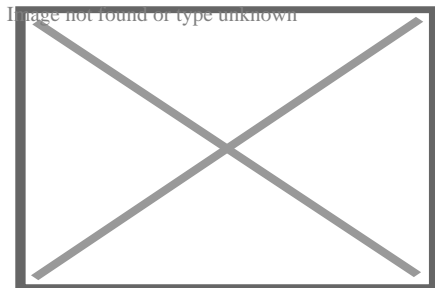
By the time Oklahoma was admitted to the Union in 1907, Oklahoma City had surpassed Guthrie, the territorial capital, as the new state's population center and commercial hub. Soon after, the capital was moved from Guthrie to Oklahoma City.^[20] Oklahoma City was a significant stop on Route 66 during the early part of the 20th century; it was prominently mentioned in Bobby Troup's 1946 jazz song "(Get Your Kicks on) Route 66" made famous by artist Nat King Cole.

Before World War II, Oklahoma City developed significant stockyards, attracting jobs and revenue formerly in Chicago and Omaha, Nebraska. With the 1928 discovery of oil within the city limits (including under the State Capitol), Oklahoma City became a major center of oil production.^[21] Post-war growth accompanied the construction of the Interstate Highway System, which made Oklahoma City a major interchange as the convergence of I-35, I-40, and I-44. It was also aided by the federal development of Tinker Air Force Base after successful lobbying efforts by the director of the Chamber of Commerce Stanley Draper.

In 1950, the Census Bureau reported the city's population as 8.6% black and 90.7% white.^[22]

In 1959, the city government launched a "Great Annexation Drive" that expanded the city's area from 80 to 475.55 square miles (207.2 to 1,231.7 square kilometers) by the end of 1961, making it the largest U.S. city by land mass at the time.^[23]

Patience Latting was elected Mayor of Oklahoma City in 1971, becoming the city's first female mayor.^[24] Latting was also the first woman to serve as mayor of a U.S. city with over 350,000 residents.^[24]



Oklahoma City National Memorial at Christmas.

Like many other American cities, the center city population declined in the 1970s and 1980s as families followed newly constructed highways to move to newer housing in nearby suburbs. Urban renewal projects in the 1970s, including the Pei Plan, removed older structures but failed to spark much new development, leaving the city dotted with vacant lots used for parking. A notable exception was the city's construction of the Myriad Gardens and Crystal Bridge, a botanical garden and modernistic conservatory in the heart of downtown. Architecturally significant historic buildings lost to clearances were the Criterion Theater,^{[25][26]} the Baum Building,^[27] the Hales Building,^{[28][29]} and the Biltmore Hotel.^[30]

In 1993, the city passed a massive redevelopment package known as the Metropolitan Area Projects (MAPS), intended to rebuild the city's core with civic projects to establish more activities and life in downtown. The city added a new baseball park; a central library; renovations to the civic center, convention center, and fairgrounds; and a water canal in the Bricktown entertainment district. Water taxis transport passengers within the district, adding color and activity along the canal. MAPS has become one of the most successful public-private partnerships undertaken in the U.S., exceeding \$3 billion in private investment as of 2010.^[31] As a result of MAPS, the population in downtown housing has exponentially increased, with the demand for additional residential and retail amenities, such as groceries, services, and shops.

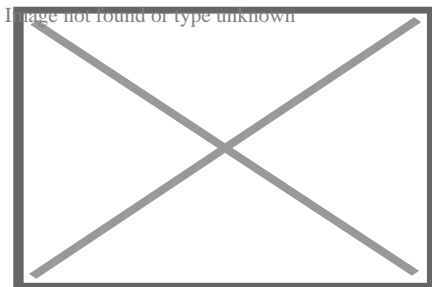
Since the completion of the MAPS projects, the downtown area has seen continued development. Several downtown buildings are undergoing renovation/restoration. Notable among these was the restoration of the Skirvin Hotel in 2007. The famed First National Center is also being renovated.

Residents of Oklahoma City suffered substantial losses on April 19, 1995, when Timothy McVeigh detonated a bomb in front of the Murrah building. The building was destroyed (the remnants of which had to be imploded in a controlled demolition later that year), more than 100 nearby buildings suffered severe damage, and 168 people were killed.^[32] The site has been commemorated as the Oklahoma City National Memorial and Museum.^[33] Since its opening in 2000, over three million people have visited. Every year on April 19, survivors, families, and friends return to the memorial to read the names of each person lost. McVeigh was executed by lethal injection on June 11, 2001.

The "Core-to-Shore" project was created to relocate I-40 one mile (1.6 km) south and replace it with a boulevard to create a landscaped entrance to the city.^[34] This also allows the central portion of the city to expand south and connect with the shore of the Oklahoma River. Several elements of "Core to Shore" were included in the MAPS 3 proposal approved by voters in late 2009.

Geography

[edit]



Mid-May 2006 photograph of Oklahoma City taken from the International Space Station (ISS)

Oklahoma City lies along one of the primary corridors into Texas and Mexico and is a three-hour drive from the Dallas-Fort Worth metroplex. The city is in the Frontier Country region in the state's center, making it ideal for state government.

According to the United States Census Bureau, the city has a total area of 620.34 square miles (1,606.7 km²),^[35] of which 601.11 square miles (1,556.9 km²) is land and 19.23 square miles (49.8 km²) is water.

Oklahoma City lies in the Sandstone Hills region of Oklahoma, known for hills of 250 to 400 feet (80 to 120 m) and two species of oak: blackjack oak (*Quercus marilandica*) and post oak (*Q. stellata*).^[36] The northeastern part of the city and its eastern suburbs fall into an ecological region known as the Cross Timbers.^[37]

The city is roughly bisected by the North Canadian River (recently renamed the Oklahoma River inside city limits). The North Canadian once had sufficient flow to flood every year, wreaking destruction on surrounding areas, including the central business district and the original Oklahoma City Zoo.^[38] In the 1940s, a dam was built on the river to manage the flood control and reduce its level.^[39] In the 1990s, as part of the citywide revitalization project known as MAPS, the city built a series of low-water dams, returning water to the portion of the river flowing near downtown.^[40] The city has three large lakes: Lake Hefner and Lake Overholser, in the northwestern quarter of the city; and the largest, Lake Stanley Draper, in the city's sparsely populated far southeast portion.

The population density typically reported for Oklahoma City using the area of its city limits can be misleading. Its urbanized zone covers roughly 244 square miles (630 km²) resulting in a 2013 estimated density of 2,500 per square mile (970/km²), compared with larger rural watershed areas incorporated by the city, which cover the remaining 377 sq mi (980 km²) of the city limits.^[41]

Oklahoma City is one of the largest cities in the nation in compliance with the Clean Air Act.^[42]

Tallest buildings

[edit]

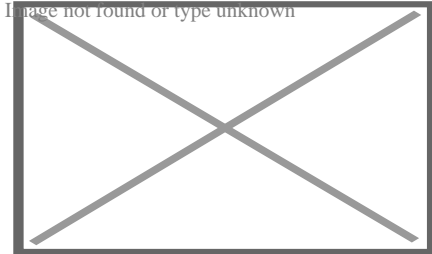
Main article: List of tallest buildings in Oklahoma City

Rank	Building	Height	Floors	Built	Ref.
1	Devon Energy Center	844 feet (257 m)	50	2012	^[43]
2	BancFirst Tower	500 feet (152 m)	36	1971	^[44]
3	First National Center	446 feet (136 m)	33	1931	^[45]
4	BOK Park Plaza	433 feet (132 m)	27	2017	^[46]
5	Oklahoma Tower	410 feet (125 m)	31	1982	^[47]
6	Strata Tower	393 feet (120 m)	30	1973	^[48]
7	City Place	391 feet (119 m)	33	1931	^[49]
8	Valliance Bank Tower	321 feet (98 m)	22	1984	^[50]
9	Leadership Square North	285 feet (87 m)	22	1984	^[51]
10	Arvest Tower	281 feet (86 m)	16	1972	^[52]

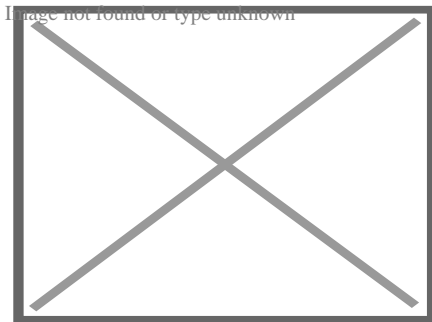
Neighborhoods

[edit]

Main article: Neighborhoods of Oklahoma City



Automobile Alley in Oklahoma City



Looking up in the heart of Oklahoma City's Central Business District

Oklahoma City neighborhoods are highly varied, with affluent historic neighborhoods located next to districts that have not wholly recovered from the economic and social decline of the 1970s and 1980s.^{*[citation needed]*}

The city is bisected geographically and culturally by the North Canadian River, which divides North Oklahoma City and South Oklahoma City. The north side is characterized by diverse and fashionable urban neighborhoods near the city center and sprawling suburbs further north. South Oklahoma City is generally more blue-collar working class and significantly more industrial, having grown up around the Stockyards and meat packing plants at the turn of the century. It is also the center of the city's rapidly growing Latino community.

Downtown Oklahoma City, which has 7,600 residents, is seeing an influx of new private investment and large-scale public works projects, which have helped to revitalize a central business district left almost deserted by the Oil Bust of the early 1980s. The centerpiece of downtown is the newly renovated Crystal Bridge and Myriad Botanical Gardens, one of the few elements of the Pei Plan to be completed. In 2021, a massive new central park will link the gardens near the CBD and the new

convention center to be built just south of it to the North Canadian River as part of a massive works project known as "Core to Shore"; the new park is part of MAPS3, a collection of civic projects funded by a one-cent temporary (seven-year) sales tax increase.^[53]

Climate

[edit]

Main article: Climate of Oklahoma City

Oklahoma City has a temperate humid subtropical climate (Köppen: *Cfa*, Trewartha: *Cfak*), along with significant continental influences. The city features hot, humid summers and cool winters. Prolonged and severe droughts (sometimes leading to wildfires in the vicinity) and hefty rainfall leading to flash flooding and flooding occur regularly. Consistent winds, usually from the south or south-southeast during the summer, help temper the hotter weather. Consistent northerly winds during the winter can intensify cold periods. Severe ice storms and snowstorms happen sporadically during the winter.

The average temperature is 61.4 °F (16.3 °C), with the monthly daily average ranging from 39.2 °F (4.0 °C) in January to 83.0 °F (28.3 °C) in July. Extremes range from 17 °F (−27 °C) on February 12, 1899 to 113 °F (45 °C) on August 11, 1936, and August 3, 2012;^[54] The last sub-zero (Fahrenheit) reading was 14 °F (−26 °C) on February 16, 2021.^[55]^[56] Temperatures reach 100 °F (38 °C) on 10.4 days of the year, 90 °F (32 °C) on nearly 70 days, and fail to rise above freezing on 8.3 days.^[55] The city receives about 35.9 inches (91.2 cm) of precipitation annually, of which 8.6 inches (21.8 cm) is snow.

The report "Regional Climate Trends and Scenarios for the U.S. National Climate Assessment" (NCA) from 2013 by NOAA projects that parts of the Great Plains region can expect up to 30% (high emissions scenario based on CMIP3 and NARCCAP models) increase in extreme precipitation days by mid-century. This definition is based on days receiving more than one inch of rainfall.^[57]

Extreme weather

[edit]

Oklahoma City has an active severe weather season from March through June, especially during April and May. Being in the center of what is colloquially referred to as Tornado Alley, it is prone to widespread and severe tornadoes, as well as severe hailstorms and occasional derechos. Tornadoes occur every month of the year, and a secondary smaller peak also occurs during autumn, especially in October. The Oklahoma City metropolitan area is one of the most tornado-prone major cities in the world, with about 150 tornadoes striking within the city limits since 1890. Since the time weather records have been kept, Oklahoma City has been struck by 13 violent tornadoes, eleven rated F/EF4 and two rated F/EF5.^[14]

On May 3, 1999, parts of Oklahoma City and surrounding communities were impacted by a tornado. It was the last U.S. tornado to be given a rating of F5 on the Fujita scale before the Enhanced Fujita scale replaced it in 2007. While the tornado was in the vicinity of Bridge Creek to the southwest, wind speeds of 318 mph (510 km/h) were estimated by a mobile Doppler radar, the highest wind speeds ever recorded on Earth.^[58] A second top-of-the-scale tornado occurred on May 20, 2013; South Oklahoma City, along with Newcastle and Moore, was hit by an EF5 tornado. The tornado was 0.5 to 1.3 miles (0.80 to 2.09 km) wide and killed 23 people.^[59] On May 31, less than two weeks after the May 20 event, another outbreak affected the Oklahoma City area. Within Oklahoma City, the system spawned an EF1 and an EF0 tornado, and in El Reno to the west, an EF3 tornado occurred. This lattermost tornado, which was heading in the direction of Oklahoma City before it dissipated, had a width of 2.6 miles (4.2 km), making it the widest tornado ever recorded. Additionally, winds over 295 mph (475 km/h) were measured, one of the two highest wind records for a tornado.^[60]

With 19.48 inches (495 mm) of rainfall, May 2015 was Oklahoma City's record-wettest month since record-keeping began in 1890. Across Oklahoma and Texas generally, there was a record flooding in the latter part of the month.^[61]

Climate data for Oklahoma City (Will Rogers World Airport), 1991–2020 normals,^[a] extended 1890–present^[b]

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Record high °F (°C)	83 (28)	92 (33)	97 (36)	100 (38)	104 (40)	107 (42)	110 (43)	113 (45)	108 (42)	97 (36)	87 (31)	86 (30)
Mean maximum °F (°C)	71.7 (22.1)	77.1 (25.1)	84.2 (29.0)	86.9 (30.5)	92.3 (33.5)	96.4 (35.8)	102.4 (39.1)	101.5 (38.6)	96.2 (35.7)	88.9 (31.6)	79.1 (26.2)	71.2 (21.8)
Mean daily maximum °F (°C)	49.3 (9.6)	53.8 (12.1)	62.9 (17.2)	71.1 (21.7)	78.9 (26.1)	87.5 (30.8)	93.1 (33.9)	92.2 (33.4)	83.9 (28.8)	72.8 (22.7)	60.7 (15.9)	50.4 (10.2)

Daily mean °F (°C)	38.2 (3.4)	42.3 (5.7)	51.2 (10.7)	59.3 (15.2)	68.2 (20.1)	76.9 (24.9)	81.7 (27.6)	80.7 (27.1)	72.7 (22.6)	61.1 (16.2)	49.2 (9.6)	40.0 (4.4)
Mean daily minimum °F (°C)	27.0 (?2.8)	30.8 (?0.7)	39.5 (4.2)	47.5 (8.6)	57.6 (14.2)	66.2 (19.0)	70.3 (21.3)	69.1 (20.6)	61.5 (16.4)	49.4 (9.7)	37.7 (3.2)	29.5 (?1.4)
Mean minimum °F (°C)	11.7 (?11.3)	15.4 (?9.2)	21.5 (?5.8)	32.3 (0.2)	43.8 (6.6)	56.6 (13.7)	63.6 (17.6)	61.7 (16.5)	48.4 (9.1)	33.8 (1.0)	21.7 (?5.7)	14.3 (?9.8)
Record low °F (°C)	?11 (?24)	?17 (?27)	1 (?17)	20 (?7)	32 (0)	46 (8)	53 (12)	49 (9)	35 (2)	16 (?9)	9 (?13)	?8 (?22)
Average precipitation inches (mm)	1.32 (34)	1.42 (36)	2.55 (65)	3.60 (91)	5.31 (135)	4.49 (114)	3.59 (91)	3.60 (91)	3.72 (94)	3.32 (84)	1.68 (43)	1.79 (45)
Average snowfall inches (cm)	1.8 (4.6)	1.8 (4.6)	0.8 (2.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.5 (1.3)	1.8 (4.6)
Average precipitation days (? 0.01 in)	5.0	5.7	6.9	7.9	10.0	8.6	6.0	6.7	7.1	7.5	5.8	5.7
Average snowy days (? 0.1 in)	1.3	1.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.4
Average relative humidity (%)	66.6	65.7	61.3	61.1	67.5	67.2	60.9	61.6	67.1	64.4	67.1	67.8
Average dew point °F (°C)	23.7 (?4.6)	28.0 (?2.2)	35.2 (1.8)	45.1 (7.3)	55.8 (13.2)	63.7 (17.6)	65.3 (18.5)	64.4 (18.0)	59.5 (15.3)	47.7 (8.7)	37.0 (2.8)	27.5 (?2.5)
Mean monthly sunshine hours	200.8	189.7	244.2	271.3	295.2	326.1	356.6	329.3	263.7	245.1	186.5	180.9
Mean daily daylight hours	10.1	10.9	12.0	13.1	14.1	14.5	14.3	13.4	12.4	11.3	10.3	9.8
Percent possible sunshine	64	62	66	69	68	75	80	79	71	70	60	60

Average
ultraviolet
index



Source 1: NOAA (relative humidity and sun 1961-1990)^[62]^[55]^[63]

Source 2: Weather Atlas(Daylight-UV) ^[64]

Demographics

[edit]

Population of Oklahoma City 1890-2022

Census	Pop.	Note	%±
1890	4,151	—	
1900	10,037		141.8%
1910	64,205		539.7%
1920	91,295		42.2%
1930	185,389		103.1%
1940	204,424		10.3%
1950	243,504		19.1%
1960	324,253		33.2%
1970	368,164		13.5%
1980	404,014		9.7%
1990	444,719		10.1%
2000	506,132		13.8%
2010	579,999		14.6%
2020	681,054		17.4%
2024 (est.)	709,330 ^[65]		4.2%

U.S. Decennial Census^[66]
1790-1960^[67] 1900-1990^[68]
1990-2000^[69] 2010^[70]

In the 2010 census, there were 579,999 people, 230,233 households, and 144,120 families in the city. The population density was 956.4 inhabitants per square mile (321.9/km²). There were 256,930 housing units at an average density of 375.9 per square mile (145.1/km²). By the 2020 census, its population grew to 681,054.^[71]

Of Oklahoma City's 579,999 people in 2010, 44,541 resided in Canadian County, 63,723 lived in Cleveland County, 471,671 resided in Oklahoma County, and 64 resided in Pottawatomie County.^[72]

In 2010, there were 230,233 households, 29.4% of which had children under 18 living with them, 43.4% were married couples living together, 13.9% had a female householder with no husband present, and 37.4% were non-families. One person households account for 30.5% of all households, and 8.7% of all households had someone living alone who was 65 years of age or older. The average household size was 2.47 and the average family size was 3.11.^[73]

According to the American Community Survey 1-year estimates in 2022, the median income for a household in the city was \$63,713, and the median income for a family was \$80,833. Married-couple families \$99,839, and nonfamily households \$40,521.^[74]] The per capita income for the city was \$35,902.^[75] 15.5% of the population and 11.2% of families were below the poverty line. Of the total population, 20.1% of those under 18 and 10.6% of those 65 and older lived below the poverty line.^[76]

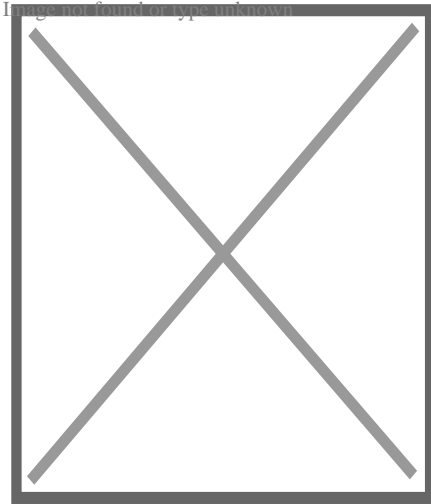
In the 2000 census, Oklahoma City's age composition was 25.5% under the age of 18, 10.7% from 18 to 24, 30.8% from 25 to 44, 21.5% from 45 to 64, and 11.5% who were 65 years of age or older. The median age was 34 years. For every 100 females, there were 95.6 males. For every 100 females age 18 and over, there were 92.7 males.

Oklahoma City has experienced significant population increases since the late 1990s. It is the first city in the state to record a population greater than 600,000 residents and the first city in the Great Plains region to record a population greater than 600,000 residents. It is the largest municipal population of the Great Plains region (Oklahoma, Kansas, Nebraska, South Dakota, North Dakota).^[ambiguous]

In the 2020 census, there were 268,035 households in the city, out of which 81,374 households (30.4%) were individuals, 113,161 (42.2%) were opposite-sex married couples, 17,699 (6.6%) were unmarried opposite-sex partnerships, and 2,930 (1.1%) were same-sex married couples or partnerships.^[77]

Race and ethnicity

[edit]



Map of racial distribution of the Oklahoma City area, 2020 U.S. census.
 Each dot is one person: ● White

● Black

● Asian

● Hispanic

● Multiracial

● Native American/Other

Historical racial composition	2020 ^[71]	2010 ^[78]	1990 ^[22]	1970 ^[22]	1940 ^[22]
White (Non-Hispanic)	49.5%	56.7%	72.9%	82.2%	90.4%
Hispanic or Latino	21.3%	17.2%	5.0%	2.0%	n/a
Black or African American	13.8%	14.8%	16.0%	13.7%	9.5%
Mixed	7.6%	4.0%	0.4%	–	–
Asian	4.6%	4.0%	2.4%	0.2%	–
Native American	3.4%	3.1%	4.2%	2.0%	0.1%

According to the 2020 census, the racial composition of Oklahoma City was as follows:^[79] White or European American 49.5%, Hispanic or Latino 21.3%, Black or African American 13.8%, Asian 4.6%, Native American 2.8%, Native Hawaiian and Other Pacific Islander 0.2%, other race 0.4%, and two or more races (non-Hispanic) 7.6%. Its population has diversified since the 1940s census, where 90.4% was non-

Hispanic white.^[22] An analysis in 2017 found Oklahoma City to be the 8th least racially segregated significant city in the United States.^[80] Of the 20 largest US cities, Oklahoma City has the second-highest percentage of the population reporting two or more races on the Census, 7.6%, second to 8.9% in New York City.

2020

[edit]

Oklahoma City – Racial and ethnic composition

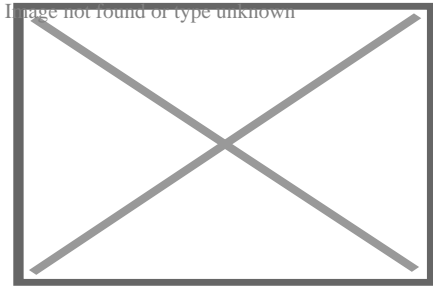
Note: the US Census treats Hispanic/Latino as an ethnic category. This table excludes Latinos from the racial categories and assigns them to a separate category.

Hispanics/Latinos may be of any race.

Race / Ethnicity (NH = Non-Hispanic)	Pop 2000 [81]	Pop 2010 [82]	Pop 2020 [83]	% 2000	% 2010	% 2020
White alone (NH)	327,225	328,582	337,063	64.65%	56.65%	49.49%
Black or African American alone (NH)	76,994	85,744	93,767	15.21%	14.78%	13.77%
Native American or Alaska Native alone (NH)	16,406	18,208	18,757	3.24%	3.14%	2.75%
Asian alone (NH)	17,410	23,051	31,163	3.44%	3.97%	4.58%
Pacific Islander alone (NH)	278	464	971	0.05%	0.08%	0.14%
Some Other Race alone (NH)	452	700	2,700	0.09%	0.12%	0.40%
Mixed Race or Multi-Racial (NH)	15,999	23,212	51,872	3.16%	4.00%	7.62%
Hispanic or Latino (any race)	51,368	100,038	144,761	10.15%	17.25%	21.26%
Total	506,132	579,999	681,054	100.00%	100.00%	100.00%

Metropolitan statistical area

[edit]



Old Interstate 40 Crosstown, Oklahoma City

Oklahoma City is the principal city of the eight-county Oklahoma City metropolitan statistical Area in Central Oklahoma and is the state's largest urbanized area. As of 2015, the metro area was the 41st largest in the nation based on population.^[84]

Religion

[edit]

The Association of Religion Data Archives in 2020 reported that the Southern Baptist Convention was the city and metropolitan area's most prominent Christian tradition with 213,008 members, Christianity being the area's predominant religion. Non/interdenominational Protestants were the second largest tradition with 195,158 members. The Roman Catholic Church claimed 142,491 adherents throughout the metropolitan region and Pentecostals within the Assemblies of God USA numbered 48,470.^[85] The remainder of Christians in the area held to predominantly Evangelical Christian beliefs in numerous evangelical Protestant denominations. Outside of Christendom, there were 4,230 practitioners of Hinduism and 2,078 Mahayana Buddhists. An estimated 8,904 residents practiced Islam during this study.^[85]

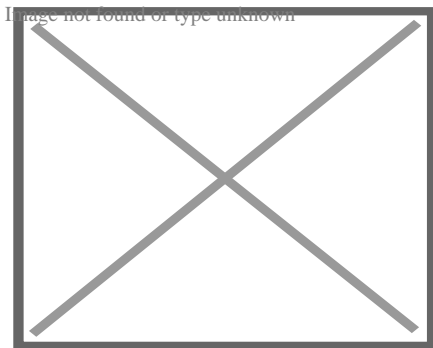
Crime

[edit]

Law enforcement claims Oklahoma City has traditionally been the territory of the notorious Juárez Cartel, but the Sinaloa Cartel has been reported as trying to establish a foothold in Oklahoma City. There are many rival gangs in Oklahoma City, one whose headquarters has been established in the city, the Southside Locos, traditionally known as Sureños.^[86]

Oklahoma City also has its share of violent crimes, particularly in the 1970s. The worst occurred in 1978 when six employees of a Sirloin Stockade restaurant on the city's south side were murdered execution-style in the restaurant's freezer. An intensive investigation followed, and the three individuals involved, who also killed three others in Purcell, Oklahoma, were identified. One, Harold Stafford, died in a motorcycle accident in Tulsa not long after the restaurant murders. Another, Verna Stafford, was sentenced to life without parole after being granted a new trial after she had been sentenced to death. Roger Dale Stafford, considered the mastermind of the murder spree, was executed by lethal injection at the Oklahoma State Penitentiary in 1995.^[87]

The Oklahoma City Police Department has a uniformed force of 1,169 officers and 300+ civilian employees. The department has a central police station and five substations covering 2,500 police reporting districts that average 1/4 square mile in size.



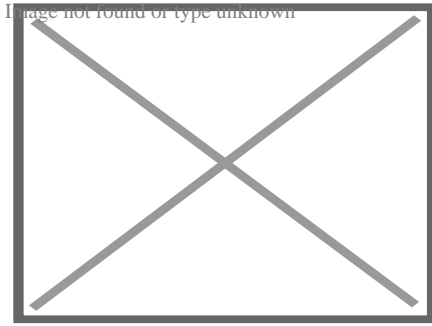
The Murrah Federal Building after the attack

On April 19, 1995, the Alfred P. Murrah Federal Building was destroyed by a fertilizer bomb manufactured and detonated by Timothy McVeigh. The blast and catastrophic collapse killed 168 people and injured over 680. The blast shock-wave destroyed or damaged 324 buildings within a 340-meter radius, destroyed or burned 86 cars, and shattered glass in 258 nearby buildings, causing at least an estimated \$652 million. McVeigh was convicted and subsequently executed by lethal injection on June 11, 2001.

Economy

[edit]

See also: List of companies based in Oklahoma City



The Sonic Drive-In restaurant chain is headquartered in Oklahoma City.

The economy of Oklahoma City, once just a regional power center of government and energy exploration, has since diversified to include the sectors of information technology, services, health services, and administration. The city is headquarters to two Fortune 500 companies: Expand Energy and Devon Energy,^[88] as well as being home to Love's Travel Stops & Country Stores, which is ranked thirteenth on Forbes' list of private companies.^[89]

As of March 2024, the top 20 employers in the city were:^[90]

#	Employer	# of employees
1	State of Oklahoma (State Capital)	37,600
2	Tinker Air Force Base	26,000
3	Oklahoma State University-Stillwater	13,940
4	University of Oklahoma-Norman	11,530
5	Integrus Health	11,000
6	Amazon	8,000
7	Hobby Lobby Stores (HQ)	6,500
8	Mercy Health Center (HQ)	6,500
9	SSM Health Care (Regional HQ)	5,600
10	FAA Mike Monroney Aeronautical Center	5,150
11	University of Oklahoma Health Sciences Center	5,000
12	City of Oklahoma City	4,500
13	OU Medical Center	4,360
14	Paycom (HQ)	4,200
15	The Boeing Company	3,740
16	Midfirst Bank (HQ)	3,100
17	Norman Regional Hospital	2,740
18	AT&T	2,700
19	OGE Energy Corp (HQ)	2,240

Other major corporations with a significant presence (over 1,000 employees) in the city of Oklahoma City include the United Parcel Service, Farmers Insurance Group, Great Plains Coca-Cola Bottling Company, Deaconess Hospital, Johnson Controls, MidFirst Bank, Rose State College, and Continental Resources.^[91]^[92]

While not in the city limits, other large employers within the Oklahoma City MSA include United States Air Force – Tinker AFB (27,000); University of Oklahoma (11,900); University of Central Oklahoma (2,900); and Norman Regional Hospital (2,800).^[91]

According to the Oklahoma City Chamber of Commerce, the metropolitan area's economic output grew by 33% between 2001 and 2005 due chiefly to economic diversification. Its gross metropolitan product (GMP) was \$43.1 billion in 2005^[93] and grew to \$61.1 billion in 2009.^[94] By 2016 the GMP had grown to \$73.8 billion.^[95]

In 2008, *Forbes* magazine reported that the city had falling unemployment, one of the strongest housing markets in the country and solid growth in energy, agriculture, and manufacturing.^[96] However, during the early 1980s, Oklahoma City had one of the worst job and housing markets due to the bankruptcy of Penn Square Bank in 1982 and then the post-1985 crash in oil prices (oil bust).^[citation needed]

Tourism

[edit]

Approximately 23.2 million visitors contributed \$4.3 billion to Oklahoma City's economy. These visitors directly spent \$2.6 billion, sustained nearly 34,000 jobs, and generated \$343 million in state and local taxes.^[97]

Business districts

[edit]

See also: Neighborhoods of Oklahoma City

Business and entertainment districts (and, to a lesser extent, local neighborhoods) tend to maintain their boundaries and character by applying zoning regulations and

business improvement districts (districts where property owners agree to a property tax surcharge to support additional services for the community).[⁹⁸] Through zoning regulations, historic districts, and other special zoning districts, including overlay districts, are well established.[⁹⁹] Oklahoma City has three business improvement districts, including one encompassing the central business district.

Culture

[edit]

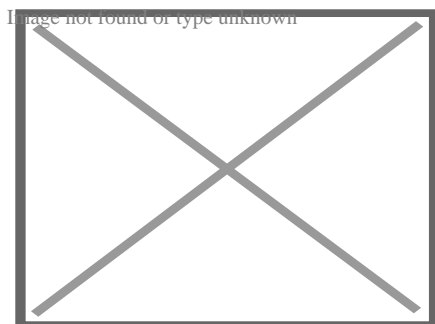
Museums and theaters

[edit]

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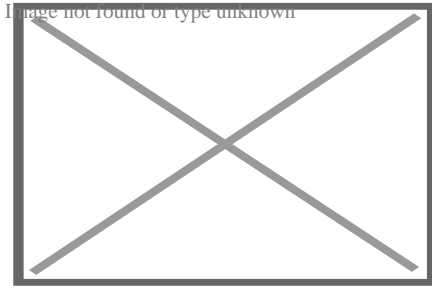


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Water taxis in Oklahoma City's downtown Bricktown neighborhood

The Donald W. Reynolds Visual Arts Center is the new downtown home for the Oklahoma City Museum of Art. The museum features visiting exhibits, original selections from its collection, a theater showing various foreign, independent, and classic films each week, and a restaurant. OKCMOA is also home to the most comprehensive collection of Chihuly glass in the world, including the 55-foot Eleanor Blake Kirkpatrick Memorial Tower in the Museum's atrium.[¹⁰⁰] The art deco Civic Center Music Hall, which was renovated in 2001, has performances from the Oklahoma City Ballet, the Oklahoma City Opera, the Oklahoma City Philharmonic, and also various concerts and traveling Broadway shows.



The Survivor Tree on the grounds of the Oklahoma City National Memorial

Other theaters include the Lyric Theatre, Jewel Box Theatre, Kirkpatrick Auditorium, the Poteet Theatre, the Oklahoma City Community College Bruce Owen Theater, and the 488-seat Petree Recital Hall at the Oklahoma City University campus. The university opened the Wanda L Bass School of Music and Auditorium in April 2006.

The Oklahoma Contemporary Arts Center (formerly City Arts Center) moved downtown in 2020, near Campbell Art Park at 11th and Broadway, after being at the Oklahoma State Fair fairgrounds since 1989. It features exhibitions, performances, classes, workshops, camps, and weekly programs.

The Science Museum Oklahoma (formerly Kirkpatrick Science and Air Space Museum at Omniplex) houses exhibits on science and aviation and an IMAX theater. The museum formerly housed the International Photography Hall of Fame (IPHF), which displays photographs and artifacts from an extensive collection of cameras and other artifacts preserving the history of photography. IPHF honors those who have contributed significantly to the art and/or science of photography and relocated to St. Louis, Missouri in 2013.

The Museum of Osteology displays over 450 real skeletons and houses over 7,000.^[101] Focusing on the form and function of the skeletal system, this 7,000 sq ft (650 m²) museum displays hundreds of skulls and skeletons from all corners of the world. Exhibits include adaptation, locomotion, classification, and diversity of the vertebrate kingdom. The Museum of Osteology is the only one of its kind in America.

The National Cowboy & Western Heritage Museum has galleries of western art^[102] and is home to the Hall of Great Western Performers.^[103]

In September 2021, the First Americans Museum opened to the public, focusing on the histories and cultures of the numerous tribal nations and many Indigenous peoples in the state of Oklahoma.^[104]

The Oklahoma City National Memorial in the northern part of Oklahoma City's downtown was created as the inscription on its eastern gate of the Memorial reads, "to honor the victims, survivors, rescuers, and all who were changed forever on April 19,

1995"; the memorial was built on the land formerly occupied by the Alfred P. Murrah Federal Building complex before its 1995 bombing. The outdoor Symbolic Memorial can be visited 24 hours a day for free, and the adjacent Memorial Museum, in the former *Journal Record* building damaged by the bombing, can be entered for a small fee. The site is also home to the National Memorial Institute for the Prevention of Terrorism, a non-partisan, nonprofit think tank devoted to preventing terrorism.

The American Banjo Museum in the Bricktown Entertainment district is dedicated to preserving and promoting the music and heritage of the banjo.^[105] Its collection is valued at \$3.5 million^[citation needed], and an interpretive exhibit tells the evolution of the banjo from its roots in American slavery, to bluegrass, to folk, and to world music.

The Oklahoma History Center is the state's history museum. Across the street from the governor's mansion at 800 Nazih Zuhdi Drive in northeast Oklahoma City, the museum opened in 2005 and is operated by the Oklahoma Historical Society. It preserves Oklahoma's history from the prehistoric to the present day.

The Oklahoma State Firefighters Museum contains early colonial firefighting tools, the first fire station in Oklahoma,^[106] and modern fire trucks.^[107]

Restaurants

[edit]

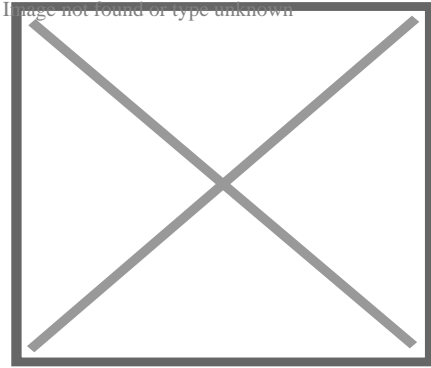
Florence's Restaurant in 2022 was named one of America's Classics by the James Beard Foundation.^[108]^[109] It was the first James Beard award for an Oklahoma entity.^[108] *The Oklahoman* called Florence's "The Grand Dame of all local restaurants".^[110] Andrew Black, chef/owner of Grey Sweater, won the 2023 James Beard Award for Best Chef Southwest.^[111]

The Food Network show *Diners, Drive-Ins, and Dives* has been to several restaurants in the Oklahoma City metropolitan area. Some of these include Cattlemen's Steakhouse, Chick N Beer, Clanton's Cafe, The Diner, Eischen's Bar, Florence's Restaurant, and Guyutes, among several others.^[112]

Sports

[edit]

Main article: Sports in Oklahoma City



Chickasaw Bricktown Ballpark, home of the Oklahoma City Comets

Oklahoma City is home to several professional sports teams, including the Oklahoma City Thunder of the National Basketball Association. The Thunder is the city's second "permanent" major professional sports franchise after the now-defunct AFL Oklahoma Wranglers. It is the third major-league team to call the city home when considering the temporary hosting of the New Orleans/Oklahoma City Hornets for the 2005–06 and 2006–07 NBA seasons. However, the Thunder was formerly the Sonics before the movement of the Sonics to OKC in 2008.

Other professional sports clubs in Oklahoma City include the Oklahoma City Comets, the Triple-A affiliate of the Los Angeles Dodgers, the Oklahoma City Energy FC of the United Soccer League, and the Crusaders of Oklahoma Rugby Football Club of USA Rugby. The Oklahoma City Blazers, a name used for decades of the city's hockey team in the Central Hockey League, has been used for a junior team in the Western States Hockey League since 2014.

The Paycom Center in downtown is the main multipurpose arena in the city, which hosts concerts, NHL exhibition games, and many of the city's pro sports teams. In 2008, the Oklahoma City Thunder became the primary tenant. Nearby in Bricktown, the Chickasaw Bricktown Ballpark is the home to the city's baseball team, the Comets. "The Brick", as it is locally known, is considered one of the finest minor league parks in the nation.^[113]

Oklahoma City hosts the World Cup of Softball and the annual NCAA Women's College World Series. The city has held 2005 NCAA Men's Basketball First and Second round and hosted the Big 12 Men's and women's basketball tournaments in 2007 and 2009. The major universities in the area – University of Oklahoma, Oklahoma City University, and Oklahoma State University – often schedule major basketball games and other sporting events at Paycom Center and Chickasaw Bricktown Ballpark. However, most home games are played at their campus stadiums.

Other major sporting events include Thoroughbred and Quarter Horse racing circuits at Remington Park and numerous horse shows and equine events that take place at

the state fairgrounds each year. There are multiple golf courses and country clubs spread around the city.

High school football

[edit]

The state of Oklahoma hosts a highly competitive high school football culture, with many teams in the Oklahoma City metropolitan area. The Oklahoma Secondary School Activities Association (OSSAA) organizes high school football into eight distinct classes based on school enrollment size. Beginning with the largest, the classes are 6A, 5A, 4A, 3A, 2A, A, B, and C. Class 6A is broken into two divisions. Oklahoma City schools include: Westmoore, Putnam City North, Putnam City, Putnam City West, Southeast, Capitol Hill, U.S. Grant, and Northwest Classen.^[114]

Oklahoma City Thunder

[edit]

The Oklahoma City Thunder of the National Basketball Association (NBA) has called Oklahoma City home since the 2008–09 season, when owner Clay Bennett relocated the franchise from Seattle, Washington. The Thunder plays home games in downtown Oklahoma City at the Paycom Center. The Thunder is known by several nicknames, including "OKC Thunder" and simply "OKC", and its mascot is Rumble the Bison.

After arriving in Oklahoma City for the 2008–09 season, the Oklahoma City Thunder secured a berth (8th) in the 2010 NBA Playoffs the following year after boasting its first 50-win season, winning two games in the first round against the Los Angeles Lakers. In 2012, Oklahoma City made it to the NBA Finals but lost to the Miami Heat in five games. In 2013, the Thunder reached the Western Conference semi-finals without All-Star guard Russell Westbrook, who was injured in their first-round series against the Houston Rockets, only to lose to the Memphis Grizzlies. In 2014, Oklahoma City reached the NBA's Western Conference Finals again but eventually lost to the San Antonio Spurs in six games.

Sports analysts have regarded the Oklahoma City Thunder as one of the elite franchises of the NBA's Western Conference and a media darling of the league's future. Oklahoma City earned Northwest Division titles every year from 2011 to 2014

and again in 2016 and has consistently improved its win record to 59 wins in 2014. The Thunder is led by third-year head coach Mark Daigneault and was anchored by All-Star point guard Russell Westbrook before a July 2019 trade that sent him to the Houston Rockets.

Hornets

[edit]

Main article: Effect of Hurricane Katrina on the New Orleans Hornets

In the aftermath of Hurricane Katrina, the NBA's New Orleans Hornets temporarily relocated to the Ford Center, playing the majority of its home games there during the 2005–06 and 2006–07 seasons. The team became the first NBA franchise to play regular-season games in Oklahoma.^[*citation needed*] The team was known as the New Orleans/Oklahoma City Hornets while playing in Oklahoma City. The team returned to New Orleans full-time for the 2007–08 season. The Hornets played their final home game in Oklahoma City during the exhibition season on October 9, 2007, against the Houston Rockets.

Professional sports teams

[edit]

Main article: Sports in Oklahoma City

Current professional sports teams

Sports Franchise	League	Sport	Founded	Stadium (capacity)
Oklahoma City Thunder	NBA	Basketball	2008	Paycom Center (18,203)
Oklahoma City Comets	MiLB	Baseball	1998	Chickasaw Bricktown Ballpark (13,066)
Oklahoma City Blue	NBA G League	Basketball	2018	Paycom Center (18,203)
Oklahoma City Energy	USL Championship (Division 2)	Soccer	2018	Taft Stadium (7,500)
Oklahoma City Football Club	Women's Premier Soccer League	Soccer	2022	Brian Harvey Field (1,500)

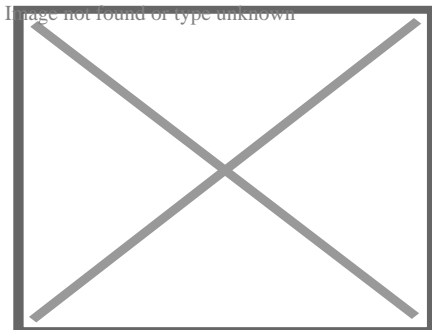
2028 Olympics

[edit]

Venues in Oklahoma City will host two events during the 2028 Summer Olympics, which will primarily be held in Los Angeles. The LA Olympic Organizing Committee opted to have canoe slalom and softball in Oklahoma City, given the lack of acceptable venues for those sports in Los Angeles. Riversport OKC will host the canoe slalom competition, while Devon Park will host the softball competition. Oklahoma City is located approximately 1,300 miles away from Los Angeles.^[15]

Parks and recreation

[edit]



Myriad Botanical Gardens, the centerpiece of downtown OKC's central business district

One of the more prominent landmarks of downtown Oklahoma City is the Crystal Bridge tropical conservatory at the Myriad Botanical Gardens, a large downtown urban park. Designed by I. M. Pei, the park also includes the Water Stage amphitheater, a bandshell, and lawn, a sunken pond complete with koi, an interactive children's garden complete with a carousel and water sculpture, various trails and interactive exhibits that rotate throughout the year including the ice skating in the Christmas winter season. In 2007, following a renovation of the stage, *Oklahoma Shakespeare In The Park* relocated to the Myriad Gardens. Bicentennial Park, also downtown located near the Oklahoma City Civic Center campus, is home to the annual *Festival of the Arts* in April.

The Scissortail Park is just south of the Myriad Gardens, a large interactive park that opened in 2021. This park contains a large lake with paddleboats, a dog park, a concert stage with a great lawn, a promenade including the Skydance Bridge, a children's interactive splash park and playground, and numerous athletic facilities. Farmers Market is a common attraction at Scissortail Park during the season, and there are multiple film showings, food trucks, concerts, festivals, and civic gatherings.

Returning to the city's first parks masterplan, Oklahoma City has at least one major park in each quadrant outside downtown. Will Rogers Park, the Grand Boulevard loop once connected Lincoln Park, Trosper Park, and Woodson Park, some sections of which no longer exist. Martin Park Nature Center is a natural habitat in far northwest Oklahoma City. Will Rogers Park is home to the *Lycan Conservatory*, the Rose Garden, and the Butterfly Garden, all built in the WPA era. In April 2005, the *Oklahoma City Skate Park* at Wiley Post Park was renamed the *Mat Hoffman Action Sports Park* to recognize Mat Hoffman, an Oklahoma City area resident and businessman who was instrumental in the design of the skate park and is a 10-time BMX World Vert champion.^[16]

Walking trails line the Bricktown Canal and the Oklahoma River in downtown. The city's bike trail system follows around Lake Hefner and Lake Overholser in the northwest and west quadrants of the city. The majority of the east shore area of Lake Hefner is taken up by parks and bike trails, including a new leashless dog park and the postwar-era *Stars and Stripes Park*, and eateries near the lighthouse. Lake Stanley Draper, in southeast Oklahoma City, is the city's largest and most remote lake, offering a genuine rural yet still urban experience.

The Oklahoma City Zoo and Botanical Garden is home to numerous natural habitats, WPA era architecture and landscaping, and major touring concerts during the summer at its amphitheater. Nearby is a combination racetrack and casino, Remington Park, which hosts both Quarter Horse (March – June) and Thoroughbred (August—December) seasons.

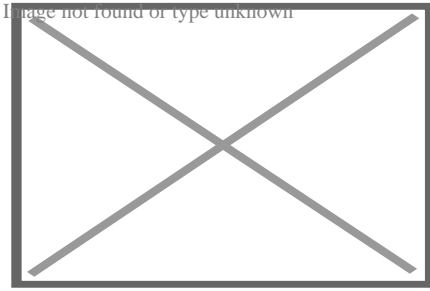
Oklahoma City is also home to the American Banjo Museum, which houses a large collection of highly decorated banjos from the early 20th century and exhibits the banjo's history and its place in American history. Concerts and lectures are also held there.

Government

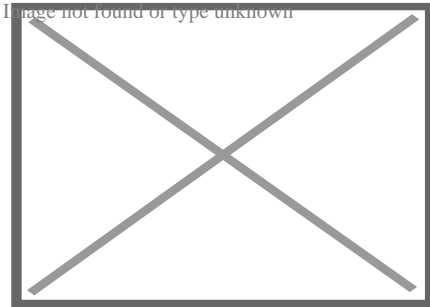
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Main article: Government of Oklahoma City

See also: List of mayors of Oklahoma City



Oklahoma State Capitol, seen from the OK History Center



The Art Deco city hall building, a block from the Civic Center

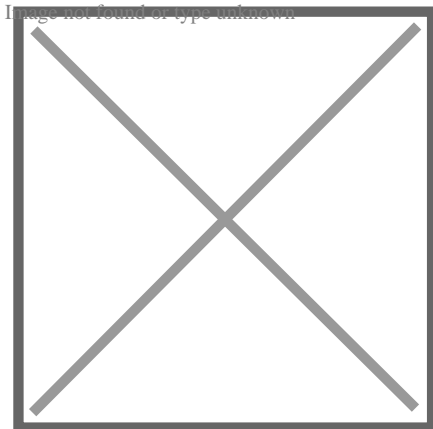
The City of Oklahoma City has operated under a council-manager form of city government since 1927.^[117] David Holt assumed the office of Mayor on April 10, 2018, after being elected two months earlier.^[118] Eight councilpersons represent each of the eight wards of Oklahoma City. The City Council appointed current City Manager Craig Freeman on November 20, 2018. Freeman took office on January 2, 2018, succeeding James D. Couch, who had served in the role since 2000. Before becoming City Manager, Craig Freeman served as Finance Director for the city.^[119]

Politics

[edit]

Similar to many American cities, Oklahoma City is politically conservative in its suburbs and liberal in the central city. In the United States House of Representatives, it is represented by Republicans Stephanie Bice and Tom Cole of the 5th and 4th districts, respectively. The city has called on residents to vote for sales tax-based projects to revitalize parts of the city. The Bricktown district is the best example of such an initiative. In the recent MAPS 3 vote, the city's fraternal police order criticized the project proposals for not doing enough to expand the police presence to keep up with the growing residential population and increased commercial activity. In September 2013, Oklahoma City area attorney David Slane announced he would pursue legal action regarding MAPS3 on claims the multiple projects that made up the

plan violate a state constitutional law limiting voter ballot issues to a single subject.^[120]



Oklahoma City region population dot map and 2016 presidential election results by precinct (click to enlarge).

Oklahoma County Voter Registration and Party Enrollment as of November 1, 2020^[121]

Party	Number of Voters	Percentage
■ Democratic	164,628	37.26%
■ Republican	189,991	43.00%
■ Libertarian	3,385	0.77%
■ Unaffiliated	83,799	18.97%
Total	441,803	100%

International relations

Consulates

[edit]

Consulate	Date	Consular District
Guatemalan Consulate-General, Oklahoma City ^[122]	06.2017	Oklahoma, Kansas
Mexican Consulate, Oklahoma City ^[123]	05.2023	Oklahoma
Germany Honorary Consulate, Oklahoma City		

Twin towns – sister cities

[edit]

Oklahoma City's sister cities are:[¹²⁴]

- ~~Brasília~~ ~~fo~~ ~~und~~ ~~of~~ ~~type~~ ~~unknown~~ ~~Brazil~~
- ~~Chengde~~ ~~Hebei~~ ~~Province~~ ~~China~~
- ~~Massachusetts~~ ~~United States~~ ~~unknown~~
- ~~Mexico~~ ~~Puebla~~ ~~Mexico~~
- ~~Peru~~ ~~Piura~~ ~~Peru~~ ~~unknown~~
- ~~Rwanda~~ ~~Kigali~~ ~~Rwanda~~ ~~unknown~~
- ~~Russia~~ ~~Yanovsk~~ ~~Russia~~ ~~(suspended August, 2022)~~
- ~~Taiwan~~ ~~Tainan~~ ~~Taiwan~~ ~~unknown~~
- ~~Taiwan~~ ~~Taipei~~ ~~Taiwan~~ ~~unknown~~
- ~~Australia~~ ~~Darwin~~ ~~Australia~~

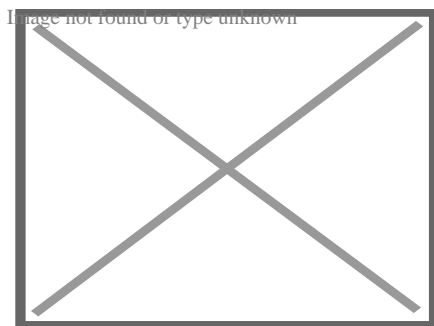
Education

[edit]

Higher education

[edit]

See also: List of colleges and universities in Oklahoma City



OU Health Sciences Center in Oklahoma City

The city is home to several colleges and universities. Oklahoma City University, formerly known as Epworth University, was founded by the United Methodist Church on September 1, 1904, and is known for its performing arts, science, mass communications, business, law, and athletic programs. OCU has its main campus in the north-central section of the city, near the city's Asia District area. OCU Law is in

the old Central High School building in the Midtown district near downtown.

The University of Oklahoma has several institutions of higher learning in the city and metropolitan area, with OU Medicine and the University of Oklahoma Health Sciences Center campuses east of downtown in the Oklahoma Health Center district, and the main campus to the south in the suburb of Norman. OU Medical Center hosts the state's only Level-One trauma center. OU Health Sciences Center is one of the nation's largest independent medical centers, employing over 12,000 people.^[125] OU is one of only four major universities in the nation to operate six medical schools.^[clarification]

The third-largest university in the state, the University of Central Oklahoma, is just north of the city in the suburb of Edmond. Oklahoma Christian University, one of the state's private liberal arts institutions, is just south of the Edmond border, inside the Oklahoma City limits.^[126]

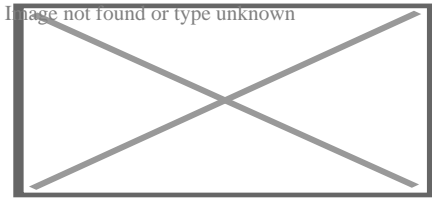
Oklahoma City Community College in south Oklahoma City is the second-largest community college in the state. Rose State College is east of Oklahoma City in suburban Midwest City. Oklahoma State University–Oklahoma City is in the "Furniture District" on the Westside. Northeast of the city is Langston University, the state's historically black college (HBCU). Langston also has an urban campus in the eastside section of the city. Southern Nazarene University, which was founded by the Church of the Nazarene, is a university in suburban Bethany, which is surrounded by the Oklahoma City city limits.

Although technically not a university, the FAA's Mike Monroney Aeronautical Center has many aspects of an institution of higher learning. Its FAA Academy is accredited by the Higher Learning Commission. Its Civil Aerospace Medical Institute (CAMI) has a medical education division responsible for aeromedical education in general, as well as the education of aviation medical examiners in the U.S. and 93 other countries. In addition, The National Academy of Science offers Research Associateship Programs for fellowship and other grants for CAMI research.

Primary and secondary

[edit]

Main article: Education in Oklahoma City



Bishop McGuinness Catholic High School

Oklahoma City is home to (as of 2009) the state's largest school district, Oklahoma City Public Schools,^[127] which covers the most significant portion of the city.^[128] The district's Classen School of Advanced Studies and Harding Charter Preparatory High School rank high among public schools nationally according to a formula that looks at the number of Advanced Placement, International Baccalaureate and/or Cambridge tests taken by the school's students divided by the number of graduating seniors.^[129] In addition, OKCPS's Belle Isle Enterprise Middle School was named the top middle school in the state according to the Academic Performance Index and recently received the Blue Ribbon School Award, in 2004 and again in 2011.^[130]

Due to Oklahoma City's explosive growth, parts of several suburban districts spill into the city. All but one of the school districts in Oklahoma County includes portions of Oklahoma City. The other districts in that county covering OKC include: Choctaw/Nicoma Park, Crooked Oak, Crutch, Deer Creek, Edmond, Harrah, Jones, Luther, McLoud, Mid-Del, Millwood, Moore, Mustang, Oakdale, Piedmont, Putnam City, and Western Heights.^[128] School districts in Cleveland County covering portions of Oklahoma City include: Little Axe, McLoud, Mid-Del, Moore, and Robin Hill.^[131] Within Canadian County, Banner, Mustang, Piedmont, Union City, and Yukon school districts include parts of OKC.^[132]

There are also charter schools. KIPP Reach College Preparatory School in Oklahoma City received the 2012 National Blue Ribbon, and its school leader, Tracy McDaniel Sr., was awarded the Terrel H. Bell Award for Outstanding Leadership.

The city also boasts several private and parochial schools. Casady School and Heritage Hall School are both examples of a private college preparatory school with rigorous academics that range among the top in Oklahoma. Providence Hall is a Protestant school. Two prominent schools of the Archdiocese of Oklahoma City include Bishop McGuinness High School and Mount Saint Mary High School. Other private schools include the Advanced Science and Technology Education Center and Crossings Christian School.

The Oklahoma School of Science and Mathematics, a school for some of the state's most gifted math and science pupils, is also in Oklahoma City.

CareerTech

[edit]

Oklahoma City has several public career and technology education schools associated with the Oklahoma Department of Career and Technology Education, the largest of which are Metro Technology Center and Francis Tuttle Technology Center.

Private career and technology education schools in Oklahoma City include Oklahoma Technology Institute, Platt College, Vatterott College, and Heritage College. The Dale Rogers Training Center is a nonprofit vocational training center for individuals with disabilities.

Media

[edit]

See also: Media in Oklahoma City

Print

[edit]

The Oklahoman is Oklahoma City's major daily newspaper and is the most widely circulated in the state. NewsOK.com is the Oklahoman's online presence. *Oklahoma Gazette* is Oklahoma City's independent newsweekly, featuring such staples as local commentary, feature stories, restaurant reviews, movie listings, and music and entertainment. *The Journal Record* is the city's daily business newspaper, and *okcBIZ* is a monthly publication that covers business news affecting those who live and work in Central Oklahoma.

Numerous community and international newspapers cater to the city's ethnic mosaic, such as *The Black Chronicle*, headquartered in the Eastside, the OK VIETIMES and *Oklahoma Chinese Times*, in Asia District, and various Hispanic community publications. *The Campus* is the student newspaper at Oklahoma City University. Gay publications include *The Gayly Oklahoman*.

An upscale lifestyle publication called *405 Magazine* (formerly Slice Magazine) is circulated throughout the metropolitan area.^[133] In addition, there is a magazine published by *Back40 Design Group* called *The Edmond Outlook*. It contains local

commentary and human interest pieces directly mailed to over 50,000 Edmond residents.

Ready Player One is set in Oklahoma City in the year 2045.

Broadcast

[edit]

Oklahoma City was home to several pioneers in radio and television broadcasting. Oklahoma City's WKY Radio was the first radio station transmitting west of the Mississippi River and the third radio station in the United States.^[134] WKY received its federal license in 1921 and has continually broadcast under the same call letters since 1922. In 1928, WKY was purchased by E.K. Gaylord's Oklahoma Publishing Company and affiliated with the NBC Red Network; in 1949, WKY-TV (channel 4) went on the air and later became the first independently owned television station in the U.S. to broadcast in color.^[134] In mid-2002, WKY radio was purchased outright by Citadel Broadcasting, who was bought out by Cumulus Broadcasting in 2011. The Gaylord family earlier sold WKY-TV in 1976, which has gone through a succession of owners (what is now KFOR-TV is owned by Nexstar Media Group as of October 2019).

The major U.S. broadcast television networks have affiliates in the Oklahoma City market (ranked 41st for television by Nielsen and 48th for radio by Arbitron, covering a 34-county area serving the central, north-central and west-central sections of Oklahoma); including NBC affiliate KFOR-TV (channel 4), ABC affiliate KOCO-TV (channel 5), CBS affiliate KWTW-DT (channel 9, the flagship of locally based Griffin Media), PBS station KETA-TV (channel 13, the flagship of the state-run OETA member network), Fox affiliate KOKH-TV (channel 25), independent station KOCB (channel 34), CW owned-and-operated station KAUT-TV (channel 43), MyNetworkTV affiliate KSBI-TV (channel 52), and Ion Television affiliate KOPX-TV (channel 62). The market is also home to several religious stations, including TBN owned-and-operated station KTBO-TV (channel 14) and Norman-based Daystar owned-and-operated station KOCM (channel 46).

Despite the market's geographical size, none of the English-language commercial affiliates in the Oklahoma City designated market area operate full-power satellite stations covering the far northwestern part of the state (requiring cable or satellite to view them). However, KFOR-TV, KOCO-TV, KWTW-DT, and KOKH-TV each operate low-power translators in that portion of the market. Oklahoma City is one of the few

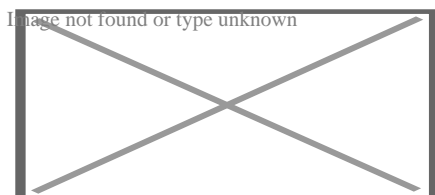
markets between Chicago and Dallas to have affiliates of two or more of the significant Spanish-language broadcast networks: Telemundo affiliate KTUZ-TV (channel 30), Woodward-based Univision/UniMás affiliate KUOK 35 (whose translator KUOK-CD, channel 36, serves the immediate Oklahoma City area), and Estrella TV affiliate KOCY-LD (channel 48). (Locally based Tyler Media Group, which owns the three stations above, also owns eight radio stations in the market, including Regional Mexican-formatted KTUZ-FM (106.7) and news–talk outlet KOKC (1520 AM).)

Infrastructure

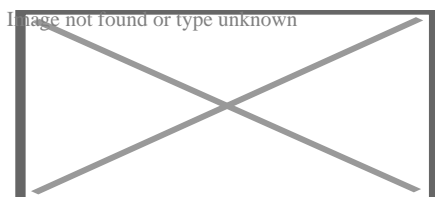
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Fire department

[edit]



OKCFD dive team at Lake Hefner



OKCFD ambulance

Oklahoma City is protected by the Oklahoma City Fire Department (OKCFD), which employs 1015 paid, professional firefighters. The current Chief of Department is Richard Kelley, and the department is commanded by three Deputy Chiefs, who – along with the department chief – oversee the Operational Services, Prevention Services, and Support Services bureaus. The OKCFD operates out of 37 fire stations throughout the city in six battalions. The OKCFD operates a fire apparatus fleet of 36 engine companies (including 30 paramedic engines), 13 ladder companies, 16 brush pumper units, six water tankers, two hazardous materials units, one Technical Rescue Unit, one Air Supply Unit, six Arson Investigation Units, and one Rehabilitation Unit along with several special units. Each engine Company is staffed with a driver, an officer, and one to two firefighters, while each ladder company is staffed with a driver, an officer, and one firefighter. The minimum staffing for each shift is 213 personnel.

The Oklahoma City Fire Department responds to over 70,000 emergency calls annually.^[135]^[136]^[137]

Transportation

[edit]

Main article: Transportation in Oklahoma City

Highway

[edit]

Oklahoma City is an integral point on the United States Interstate Network, with three major interstate highways – Interstate 35, Interstate 40, and Interstate 44 – bisecting the city. Interstate 240 connects Interstate 40 and Interstate 44 in south Oklahoma City. At the same time, Interstate 235 spurs from Interstate 44 in north-central Oklahoma City into downtown. Interstate 44, between NW 23rd St and NW 36th St, is the busiest roadway in the city and state, with an average daily traffic count of 167,200 vehicles per day in 2018.^[138]

Major state expressways through the city include Lake Hefner Parkway (SH-74), the Kilpatrick Turnpike, Airport Road (SH-152), and Broadway Extension (US-77) which continues from I-235 connecting Central Oklahoma City to Edmond. Lake Hefner Parkway runs through northwest Oklahoma City, while Airport Road runs through southwest Oklahoma City and leads to Will Rogers World Airport. The Kilpatrick Turnpike loops around north and west Oklahoma City.

Oklahoma City also has several major national and state highways within its city limits. Shields Boulevard (US-77) continues from E.K. Gaylord Boulevard in downtown Oklahoma City and runs south, eventually connecting to I-35 near the suburb of Moore, Oklahoma. Northwest Expressway (Oklahoma State Highway 3) runs from North Classen Boulevard in north-central Oklahoma City to the northwestern suburbs.

The following significant expressways traverse Oklahoma City:

- Interstate 35
- Interstate 40 (Crosstown Expressway, Stanley Draper Expressway, Tinker Diagonal, Tom Stead Memorial Highway)
- Interstate 44 (Turner Turnpike, Belle Isle Freeway, Will Rogers Expressway, H.E. Bailey Turnpike)
- Interstate 235 (Centennial Expressway) / U.S. 77 (Broadway Extension)

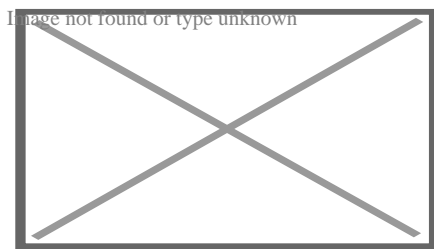
- Interstate 240 (Southwest Expressway)
- Lake Hefner Parkway (State Highway 74)
- Airport Road (State Highway 152)
- Kilpatrick Turnpike

Air

[edit]

Oklahoma City is served by two primary airports, Will Rogers World Airport and the much smaller Wiley Post Airport (incidentally, the two honorees died in the same plane crash in Alaska)^[139] Will Rogers World Airport is the state's busiest commercial airport, with 4,341,159 passengers served in 2018, a historical record.^[140]

Tinker Air Force Base, in southeast Oklahoma City, is the largest military air depot in the nation. It is a major maintenance and deployment facility for the Navy and the Air Force and the second largest military institution in the state (after Fort Sill in Lawton).



United Airlines Embraer 170 aircraft at the East Concourse of Will Rogers World Airport

Rail and intercity bus

[edit]

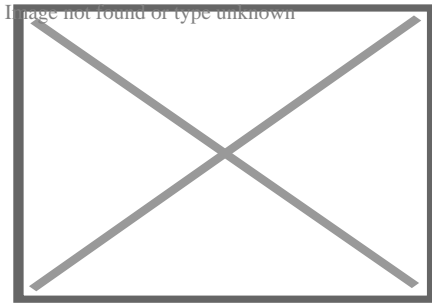
Amtrak has a station downtown at the Santa Fe Depot, with daily service to Fort Worth and the nation's rail network via the Heartland Flyer. Oklahoma City once was the crossroads of several interstate passenger railroads at the Santa Fe Depot, the Union Station, and the Missouri-Kansas-Texas Railroad station.^[141] But service at that level has long since been discontinued. However, several proposals to extend the current train service have been made, including a plan to expand the Heartland Flyer to Newton, Kansas, which is currently being connected through Amtrak Thruway. Freight service is provided by BNSF Railway, Union Pacific Railroad, and Stillwater Central.

Greyhound and several other intercity bus companies serve Oklahoma City at the Union Bus Station in downtown.

Public transit

[edit]

Main articles: Embark (transit authority) and Oklahoma City Streetcar



Streetcar of the OKC Streetcar system passing the historic First United Methodist Church, in downtown

Embark (formerly Metro Transit) is the city's public transit company. The primary transfer terminal is downtown at NW 5th Street and Hudson Avenue. Embark maintains limited coverage of the city's primary street grid using a hub-and-spoke system from the main terminal, making many journeys impractical due to the relatively small number of bus routes offered and that most trips require a transfer downtown. The city has recognized transit as a significant issue for the rapidly growing and urbanizing city. It has initiated several recent studies to improve the existing bus system, starting with a plan known as the Fixed Guideway Study.^[142] This study identified several potential commuter transit routes from the suburbs into downtown OKC as well as feeder-line bus and/or rail routes throughout the city.

Though Oklahoma City has no light rail or commuter rail service, city residents identified improved transit as one of their top priorities. From the fruits of the Fixed Guideway and other studies, city leaders strongly desire to incorporate urban rail transit into the region's future transportation plans. The greater Oklahoma City metropolitan transit plan identified from the Fixed Guideway Study includes a streetcar system in the downtown area, to be fed by enhanced city bus service and commuter rail from the suburbs including Edmond, Norman, and Midwest City. There is a significant push for a commuter rail line connecting downtown OKC with the eastern suburbs of Del City, Midwest City, and Tinker Air Force Base. In addition to commuter rail, a short heritage rail line that would run from Bricktown just a few blocks away from the Amtrak station to the Adventure District in northeast Oklahoma City is under reconstruction.

In December 2009, Oklahoma City voters passed MAPS 3, the \$777 million (7-year, 1-cent tax) initiative. This initiative would generate funding (approx. \$130 million) for the

modern Oklahoma City Streetcar system in downtown Oklahoma City and the establishment of a transit hub.

On September 10, 2013, the federal government announced that Oklahoma City would receive a \$13.8-million grant from the U.S. Department of Transportation's TIGER program. This was the first-ever grant for Oklahoma City for a rail-based initiative and is thought to be a turning point for city leaders who have applied for grants in the past, only to be denied continuously. It is believed the city will use the TIGER grant along with approximately \$10 million from the MAPS 3 Transit budget to revitalize the city's Amtrak station, becoming an Intermodal Transportation Hub, taking over the role of the existing transit hub at NW 5th/Hudson Ave.^[citation needed]

Construction of the Oklahoma City Streetcar system in Downtown OKC began in early 2017,^[143] and the system opened for service in December 2018.^{[144][145]} Also known as the Maps 3 Streetcar, it connects the areas of Bricktown, Midtown and Downtown. The 6.9 mi (11.1 km) system serves the greater Downtown area using modern low-floor streetcars. The initial system consists of two lines connecting Oklahoma City's Central Business District with the entertainment district, Bricktown, and the Midtown District. Expansion to other districts surrounding downtown and more routes in the CBD is already underway.^[citation needed]

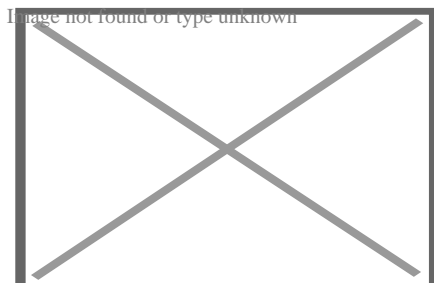
Walkability

[edit]

A 2013 study by Walk Score ranked Oklahoma City the 43rd most walkable out of the 50 largest U.S. cities. Oklahoma City has 18 neighborhoods with a Walk Score above 60, mainly close to the downtown core.^[146]

Health

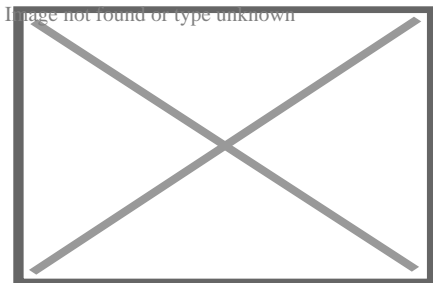
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OU Physicians Center

Oklahoma City and the surrounding metropolitan area have several healthcare facilities and specialty hospitals. In Oklahoma City's MidTown district near downtown resides the state's oldest and largest single-site hospital, St. Anthony Hospital and Physicians Medical Center.

OU Medicine, an academic medical institution on the campus of The University of Oklahoma Health Sciences Center, is home to OU Medical Center. OU Medicine operates Oklahoma's only level-one trauma center at the OU Medical Center and the state's only level-one trauma center for children at Children's Hospital at OU Medicine, [147] both of which are in the Oklahoma Health Center district. Other medical facilities operated by OU Medicine include OU Physicians and OU Children's Physicians, the OU College of Medicine, the Oklahoma Cancer Center, and OU Medical Center Edmond, the latter in the northern suburb of Edmond.



INTEGRIS Baptist Medical Center

INTEGRIS Health owns several hospitals, including INTEGRIS Baptist Medical Center, the INTEGRIS Cancer Institute of Oklahoma, [148] and the INTEGRIS Southwest Medical Center. [149] INTEGRIS Health operates hospitals, rehabilitation centers, physician clinics, mental health facilities, independent living centers, and home health agencies throughout much of Oklahoma. INTEGRIS Baptist Medical Center ranks high-performing in the following categories: Cardiology and Heart Surgery; Diabetes and Endocrinology; Ear, Nose and Throat; Gastroenterology; Geriatrics; Nephrology; Orthopedics; Pulmonology and Urology.

The Midwest Regional Medical Center is in the suburb of Midwest City; other significant hospitals include the Oklahoma Heart Hospital and the Mercy Health Center. There are 347 physicians for every 100,000 people in the city.

In the American College of Sports Medicine's annual ranking of the United States' 50 most populous metropolitan areas on the basis of community health, Oklahoma City took last place in 2010, falling five spots from its 2009 rank of 45. [150] The ACSM's report, published as part of its American Fitness Index program, cited, among other things, the poor diet of residents, low levels of physical fitness, higher incidences of

obesity, diabetes, and cardiovascular disease than the national average, low access to recreational facilities like swimming pools and baseball diamonds, the paucity of parks and low investment by the city in their development, the high percentage of households below the poverty level, and the lack of state-mandated physical education curriculum as contributing factors.^[151]

Notable people

[edit]

For a more comprehensive list, see List of people from Oklahoma City.

See also

[edit]

- Coyle v. Smith
- History of Oklahoma
- List of mayors of Oklahoma City
- USS *Oklahoma City*, 2 ships

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Notes

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- [^] Mean monthly maxima and minima (i.e. the expected highest and lowest temperature readings at any point during the year or given month) calculated based on data at said location from 1991 to 2020.
- [^] Official records for Oklahoma City were kept at the Weather Bureau Office from November 1890 to December 1953, and at Will Rogers World Airport since January 1954. For more information, see Threadex

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[edit]

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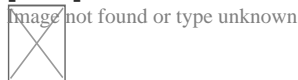
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-  Texts from Wikisource
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-  Travel information from Wikivoyage
- Official city website
- Oklahoma City tourism information
- Convention & Visitors' Bureau

- City-Data page
- Oklahoma City Historic Film Row District website Archived March 11, 2018, at the Wayback Machine
- *New York Times* travel article about Oklahoma City
- OKC.NET cultural commentary about Oklahoma City
- Voices of Oklahoma interview with Ron Norick Archived April 25, 2010, at the Wayback Machine, mayor during the Oklahoma City bombing

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City of Oklahoma City

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- Adventure District
- Asia District
- Capitol Hill
- Downtown
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- Oklahoma City Blue
- Oklahoma City Comets
- Oklahoma City Energy FC
- Oklahoma City Spark

Professional sports teams

-  **Category** Image not found or type unknown
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Articles relating to Oklahoma City

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Municipalities of the Greater Oklahoma City metropolitan area

**Population
over
500,000**

- Oklahoma City

**Population
over
100,000**

- Norman

**Population
over 50,000**

- Edmond
- Midwest City
- Moore
- Bethany

**Population
over 20,000**

- Del City
- Mustang
- Shawnee
- Yukon

**Population
over 10,000**

- Chickasha
- Choctaw
- El Reno
- Guthrie
- Newcastle
- Warr Acres
- Blanchard
- Harrah
- Noble

**Population
over 5,000**

- Piedmont
- Purcell
- Tecumseh
- Tuttle
- The Village

**Population
over 2,000**

- Bethel Acres
- Chandler
- Goldsby
- Jones
- Lexington
- McLoud
- Nichols Hills
- Nicoma Park
- Pink
- Prague
- Slaughterville
- Spencer
- Stroud
- Crescent
- Forest Park
- Langston
- Luther

**Population
over 1,000**

- Maud
- Meeker
- Minco
- Ninnekah
- Okarche
- Rush Springs
- Union City
- Carney
- Cashion
- Cole

**Population
over 500**

- Davenport
- Dibble
- Earlsboro
- Valley Brook
- Verden
- Washington
- Wayne
- Wellston

**Population
over 200**

- Alex
- Agra
- Amber
- Asher
- Bridge Creek
- Byars
- Calumet
- Cedar Valley
- Coyle
- Johnson
- Marshall
- Mulhall
- Tribbey
- Tryon
- Wanette
- Arcadia
- Bradley
- Brooksville
- Cimarron City
- Etowah
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- Kendrick
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- Orlando
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- Smith Village
- Sparks
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- Woodlawn Park
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- Grady
- Logan
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- Pottawatomie

**Population
under 200**

Counties

**Metropolitan
planning
organization**

- Association of Central Oklahoma Governments

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Skyscrapers in Oklahoma City

- Devon Energy Center
- BancFirst Tower
- First National Center
- City Place
- Oklahoma Tower
- BOK Park Plaza
- Strata Tower
- Valliance Bank Tower
- Bank of Oklahoma Plaza
- Leadership Square
- Regency Tower
- Founders Tower
- Mid America Tower
- Union Plaza
- The Classen
- Dowell Center
- 101 Park Avenue Building
- 100 Park Avenue Building
- Colcord Hotel
- 50 Penn Place
- Skirvin Hilton Hotel
- Oklahoma County Courthouse

Current

See also

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State of Oklahoma

Oklahoma City (capital)

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- Edmond
- Enid
- Lawton
- Midwest City
- Muskogee
- Moore
- Norman
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- Ponca City
- Shawnee
- Stillwater
- Tulsa
- Yukon

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- Atoka
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- Hughes
- Jackson
- Jefferson
- Johnston
- Kay
- Kingfisher
- Kiowa
- Latimer
- Le Flore
- Lincoln
- Logan
- Love
- Major
- Marshall
- Mayes
- McClain
- McClain

Counties

flag Oklahoma portal

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Municipalities and communities of Canadian County, Oklahoma,
United States

County seat: **El Reno**

- | | |
|--------------------------|---|
| Cities | <ul style="list-style-type: none">o El Renoo Geary‡o Mustango Oklahoma City‡o Piedmont‡o Yukon |
| Towns | <ul style="list-style-type: none">o Calumeto Okarche‡o Union City |
| CDP | <ul style="list-style-type: none">o Cedar Lake |
| Other communities | <ul style="list-style-type: none">o Conchoo Scott‡ |

Footnotes ‡This populated place also has portions in an adjacent county or counties

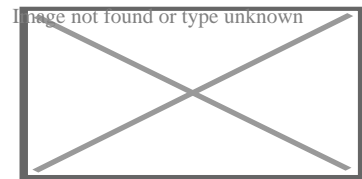
- o Oklahoma portal
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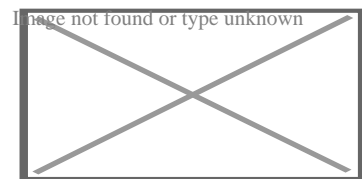
Municipalities and communities of Cleveland County, Oklahoma,
United States

County seat: **Norman**

- | | |
|---------------|--|
| Cities | <ul style="list-style-type: none">o Lexingtono Mooreo Nobleo Normano Oklahoma City‡o Purcell‡ |
|---------------|--|



Canadian County map



Cleveland County map

- Towns**
 - Etowah
 - Slaughterville

- Neighborhood**
 - Hall Park

Footnotes ‡This populated place also has portions in an adjacent county or counties

- Oklahoma portal
- United States portal

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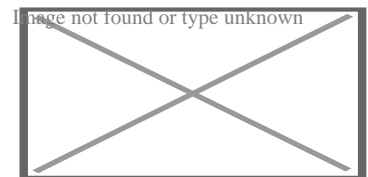
Municipalities and communities of Oklahoma County, Oklahoma, United States

County seat: **Oklahoma City**

- Cities**
 - Bethany
 - Choctaw
 - Del City
 - Edmond
 - Harrah
 - Midwest City
 - Nichols Hills
 - Nicoma Park
 - Oklahoma City‡
 - Spencer
 - The Village
 - Warr Acres
 - Arcadia
 - Forest Park
 - Jones

- Towns**
 - Lake Aluma
 - Luther
 - Smith Village
 - Valley Brook
 - Woodlawn Park
 - Britton

- Unincorporated communities**
 - Crutcho
 - Newalla
 - Wheatland



Oklahoma County map

Footnotes ‡This populated place also has portions in an adjacent county or counties

- Oklahoma portal
- United States portal

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Municipalities and communities of Pottawatomie County, Oklahoma, United States

County seat: **Shawnee**

Cities

- Maud‡
- Oklahoma City‡
- Shawnee

- Tecumseh
- Asher
- Bethel Acres
- Brooksville
- Earlsboro
- Johnson

Towns

- Macomb
- McLoud
- Pink
- St. Louis
- Tribbey
- Wanette

CDP

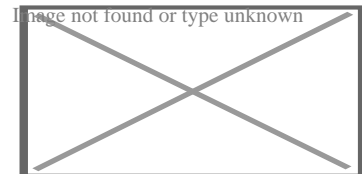
- Dale
- Aydelotte
- Bellemont
- Centerview
- Garden Grove

Other communities

- Harjo
- Pearson
- Romulus
- Sacred Heart
- Trousdale

Ghost towns

- Avoca
- Keokuk Falls



Pottawatomie County map

Footnotes ‡This populated place also has portions in an adjacent county or counties

- Oklahoma portal
- United States portal

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Capitals of the United States by jurisdiction

Nation:

- **US** Washington, D.C.

States:

- **AL** Montgomery
- **AK** Juneau
- **AZ** Phoenix
- **AR** Little Rock
- **CA** Sacramento
- **CO** Denver
- **CT** Hartford
- **DE** Dover
- **FL** Tallahassee
- **GA** Atlanta
- **HI** Honolulu
- **ID** Boise
- **IL** Springfield
- **IN** Indianapolis
- **IA** Des Moines
- **KS** Topeka
- **KY** Frankfort
- **LA** Baton Rouge
- **ME** Augusta
- **MD** Annapolis
- **MA** Boston
- **MI** Lansing
- **MN** Saint Paul
- **MS** Jackson
- **MO** Jefferson City
- **MT** Helena
- **NE** Lincoln
- **NV** Carson City
- **NH** Concord
- **NJ** Trenton
- **NM** Santa Fe
- **NY** Albany
- **NC** Raleigh
- **ND** Bismarck
- **OH** Columbus
- **OK** Oklahoma City
- **OR** Salem
- **PA** Harrisburg
- **RI** Providence
- **SC** Columbia
- **SD** Pierre

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County seats in Oklahoma

- Ada
- Altus
- Alva
- Anadarko
- Antlers
- Arapaho
- Ardmore
- Arnett
- Atoka
- Bartlesville
- Beaver
- Boise City
- Buffalo
- Chandler
- Cherokee
- Cheyenne
- Chickasha
- Claremore
- Coalgate
- Duncan
- Durant
- El Reno
- Enid
- Eufaula
- Fairview
- Frederick
- Guthrie
- Guymon
- Hobart
- Holdenville
- Hollis
- Hugo
- Idabel
- Jay
- Kingfisher
- Lawton
- Madill
- Mangum
- Marietta
- McAlester
- Medford
- Miami
- Muskogee
- New Cordell
- Newkirk
- Norman
- Nowata

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The 100 most populous cities of the United States

1. New York, New York
2. Los Angeles, California
3. Chicago, Illinois
4. Houston, Texas
5. Phoenix, Arizona
6. Philadelphia, Pennsylvania
7. San Antonio, Texas
8. Dallas, Texas
9. San Diego, California
10. Austin, Texas
11. Jacksonville, Florida
12. San Jose, California
13. Fort Worth, Texas
14. Columbus, Ohio
15. Charlotte, North Carolina
16. Indianapolis, Indiana
17. San Francisco, California
18. Seattle, Washington
19. Denver, Colorado
20. Oklahoma City, Oklahoma
21. Nashville, Tennessee
22. El Paso, Texas
23. Washington, D.C.
24. Las Vegas, Nevada
25. Portland, Oregon
26. Louisville, Kentucky
27. Memphis, Tennessee
28. Detroit, Michigan
29. Baltimore, Maryland
30. Milwaukee, Wisconsin
31. Albuquerque, New Mexico
32. Tucson, Arizona
33. Fresno, California
34. Sacramento, California
35. Mesa, Arizona
36. Kansas City, Missouri
37. Atlanta, Georgia
38. Colorado Springs, Colorado
39. Omaha, Nebraska
40. Raleigh, North Carolina
41. Virginia Beach, Virginia
42. Long Beach, California
43. Miami, Florida
44. Oakland, California
45. Minneapolis, Minnesota
46. Tulsa, Oklahoma
47. Arlington, Texas
48. Aurora, Colorado
49. New Orleans, Louisiana
50. Cleveland, Ohio
51. Anaheim, California
52. Honolulu, Hawaii
53. Henderson, Nevada
54. Stockton, California
55. Riverside, California
56. Lexington, Kentucky
57. Corpus Christi, Texas
58. Orlando, Florida
59. Irvine, California
60. Cincinnati, Ohio
61. Santa Ana, California
62. Newark, New Jersey
63. Saint Paul, Minnesota
64. Pittsburgh, Pennsylvania
65. Greensboro, North Carolina
66. Lincoln, Nebraska
67. Durham, North Carolina
68. Plano, Texas
69. Chandler, Arizona
70. North Las Vegas, Nevada
71. Chula Vista, California
72. Buffalo, New York
73. Gilbert, Arizona
74. Reno, Nevada
75. Madison, Wisconsin
76. Fort Wayne, Indiana
77. Toledo, Ohio
78. Lubbock, Texas
79. St. Petersburg, Florida
80. Laredo, Texas
81. Irving, Texas
82. Chesapeake, Virginia
83. Glendale, Arizona
84. Winston-Salem, North Carolina
85. Scottsdale, Arizona
86. Garland, Texas
87. Boise, Idaho
88. Norfolk, Virginia
89. Port St. Lucie, Florida
90. Spokane, Washington
91. Richmond, Virginia

Cities ranked by United States Census Bureau population estimates for July 1, 2022.

	Authority control databases <small>Image not found or type unknown</small> Edit this at Wikidata
International	<ul style="list-style-type: none">o VIAFo FASTo WorldCato Germanyo United States
National	<ul style="list-style-type: none">o Franceo BnF datao Czech Republico Croatiao Israel
Geographic	<ul style="list-style-type: none">o MusicBrainz area
Other	<ul style="list-style-type: none">o IdRefo NARA

About Durham Supply Inc

Photo

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Things To Do in Tulsa County

Photo

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The Tulsa Arts District

4.7 (22)

Photo

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Blue Whale of Catoosa

4.5 (3899)

Photo

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Streetwalker Tours

0 (0)

Photo

Tulsa Air and Space Museum & Planetarium

4.3 (419)

Photo

Image not found or type unknown

Philbrook Museum of Art

4.8 (3790)

Photo

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Tulsa Botanic Garden

4.7 (1397)

Driving Directions in Tulsa County

Driving Directions From Waffle House to Durham Supply Inc

Driving Directions From Catoosa to Durham Supply Inc

Driving Directions From Harmon Security Group LLC. to Durham Supply Inc

Driving Directions From Country Inn & Suites by Radisson, Tulsa, OK to Durham Supply Inc

Driving Directions From Camp Bow Wow to Durham Supply Inc

Furnace store

Heating contractor

HVAC contractor

Mobile Home Furnace Installation

Driving Directions From Bob Dylan Center to Durham Supply Inc

Driving Directions From Guthrie Green to Durham Supply Inc

Driving Directions From Tulsa Botanic Garden to Durham Supply Inc

Driving Directions From Philbrook Museum of Art to Durham Supply Inc

Driving Directions From Tours of Tulsa to Durham Supply Inc

Driving Directions From The Outsiders House Museum to Durham Supply Inc

[Mobile home supply store](#)

[Air conditioning repair service](#)

[Air conditioning store](#)

[Air conditioning system supplier](#)

Reviews for Durham Supply Inc

Durham Supply Inc

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Gerald Clifford Brewster

(5)

We will see, the storm door I bought says on the tag it's 36x80, but it's 34x80. If they return it.....they had no problems returning it. And it was no fault of there's, you measure a mobile home door different than a standard door!

Durham Supply Inc

Image not found or type unknown

Ty Spears

(5)

Bought a door/storm door combo. Turns out it was the wrong size. They swapped it out, quick and easy no problems. Very helpful in explaining the size differences from standard door sizes.

Durham Supply Inc

Image not found or type unknown

Ethel Schiller

(5)

This place is really neat, if they don't have it they can order it from another of their stores and have it there overnight in most cases. Even hard to find items for a trailer! I definitely recommend this place to everyone! O

and the prices is awesome too!

Durham Supply Inc

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B Mann

(5)

I was in need of some items for a double wide that I am remodeling and this place is the only place in town that had what I needed (I didn't even try the other rude place)while I was there I learned the other place that was in Tulsa that also sold mobile home supplies went out of business (no wonder the last time I was in there they were VERY RUDE and high priced) I like the way Dunham does business they answered all my questions and got me the supplies I needed, very friendly, I will be back to purchase the rest of my items when the time comes.

Durham Supply Inc

Image not found or type unknown

Dennis Champion

(5)

Durham supply and Royal supply seems to find the most helpful and friendly people to work in their stores, we are based out of Kansas City out here for a few remodels and these guys treated us like we've gone there for years.

Maintaining Uniform Performance with Mixed Brand Components [View GBP](#)

Check our other pages :

- [Simplifying Approval Steps for Mobile Home HVAC Financing](#)
- [Comparing Credit Requirements for Mobile Home HVAC Financing](#)
- [Budgeting Monthly Payments for Mobile Home Heating Projects](#)

Frequently Asked Questions

How can I ensure compatibility when using mixed brand components in my mobile home HVAC system?

To ensure compatibility, start by consulting the product manuals of each component for any manufacturer guidelines on compatible products. Check if there are industry standards or certifications that apply to all your chosen components. Additionally, consider working with an HVAC professional who can verify compatibility and optimize the setup based on experience with different brands.

What potential issues should I be aware of when mixing different brand components in my HVAC system?

Potential issues include communication errors between components, inefficient operation due to mismatched capacities or specifications, and voided warranties from manufacturers. Ensure all components operate at similar efficiency levels and follow recommended maintenance practices to mitigate these risks.

Can mixing brands affect the overall energy efficiency of my mobile home HVAC system?

Yes, mixing brands can affect energy efficiency if the components are not well-matched. Differences in SEER (Seasonal Energy Efficiency Ratio) ratings or other performance metrics can lead to inefficiencies. It's essential to select components that complement each other's performance characteristics to maintain optimal energy efficiency across the system.

Royal Supply Inc

Phone : +16362969959

City : Oklahoma City

State : OK

Zip : 73149

Address : Unknown Address

Google Business Profile

Company Website : <https://royal-durhamsupply.com/locations/oklahoma-city-oklahoma/>

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