

Climate Resilient Cities

A Primer on Reducing Vulnerabilities to Disasters

I/ CITY DESCRIPTION

To reduce global warming, Albuquerque has initiated a set of programs with specified targets and designed to engage partners in the community, private sector, and technical centers in informing opportunities for making the city more resilient and efficient. The city strives to make the best use of its technical, financial, and human resources in this process. Coordination, information-sharing, and resource management are given high priority. In addition, infrastructure investments are designed to maximize resources by looking for opportunities to address both mitigation and adaptation goals. While the specifics of the city's programs are tailored to its context, the concepts and processes may present some useful insights to assist local governments in East Asia in translating theory into practice.

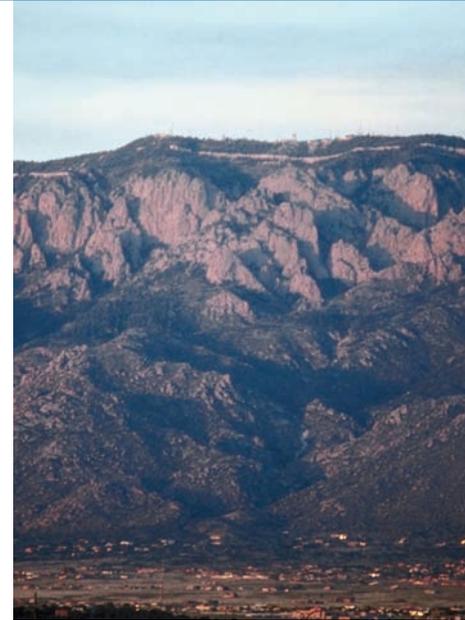
This Profile is adapted, or in some instances drawn directly, from "AlbuquerqueGreen," the city's official environmental website (<http://www.cabq.gov/albuquerquegreen>).

Population

In 1990, Albuquerque's total population was 384,736. By 2000, the population had grown to 448,607, an increase of more than 16.6 percent. The population of Albuquerque in 2006 was 507,789 and is estimated to grow to 535,239 in 2010. Albuquerque is endowed with a wealth of unique and very diverse cultures and was founded through contributions by various ethnic groups: Native Americans, Hispanics, African Americans, Anglos, and Asians. According to the 1990 U.S. Census data, the population breakdown was as follows: 132,706 (34.5 percent) Hispanic; 224,374 Anglo (58.3 percent); 10,067 Native American (2.6 percent); 10,346 African American (2.7 percent); and 6,112 Asian (1.6 percent). The average household income in 2005 was estimated to be US\$59,829, and the median household income in 2006 was estimated to be US\$43,021. The median grew by 19 percent over the past 2 years to \$49,000.

Location

Albuquerque is a high desert community located in the Central Rio Grand Valley. Water is a critical resource that requires constant attention, especially in regard to the impact of climate change. Albuquerque sits at an altitude of 5,326 feet and covers an area of 187.76 square miles with the Sandia Mountains as its eastern border, which causes the city expansion to be westward. The Sandia Mountains are part of the Rocky Mountain chain and exert a major influence on the local weather.



Albuquerque has a priority to create open-space lands to preserve a high quality of life; steps in that direction have made its Bosque Park area safe and green, created carbon sinks, and beautified the city.



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Albuquerque's latitude and altitude combine to give it a pleasant year-round climate. Albuquerque is just far enough south to be spared many of the storms that often touch northern New Mexico, as well as to be spared the heat of Phoenix and other lower-altitude cities in the same latitude.

The Office of Emergency Preparedness and its Office of Emergency Management at the Emergency Operations Center are separate from the Economic Development and Sustainability Office. Coordination between the two offices and the implementation of investment programs and climate change initiatives would benefit from a close working relationship.

The Built Environment

The city was founded in 1706, and its historic district along the banks of the Rio Grande has become a prime tourist destination. Its geography and cultural boundaries limit and direct its growth—the Sandia Mountains to the east, the Pueblo of Isleta boundary to the south, and the Pueblo of Sandia to the north. Growth thus takes place to the west, and will continue to do so. Areas of environmental concern that have come to the fore because of the city's growth include sustainability and quality of the water supply, wildfires in the city's green areas, and air quality as sprawl has moved into the western areas. Transportation is automobile-dependent and thus contributes to Albuquerque's sprawling growth pattern, which the city would like to counteract.

Development density is an issue, as are the materials of which buildings are constructed. Traditional architecture

featured adobe construction, which naturally maintains interior temperatures at a comfortable level. True adobe construction, however, is more expensive, and builders often focus on the popular "adobe look," which doesn't confer the same climate control advantages.

Albuquerque became an important urban area in the region during World War II. The valley areas were already settled; as a result, development occurred in the western and eastern mesa areas of the city. From the early 1920s to the early 1980s, development took place on the east mesa in the form of single-family and multi-family dwellings, and strip commercial development and shopping malls. This pattern of low-rise development of the city led to sprawl and increased the overall built area of the city, which explains the suburban automobile patterns that now dominate the area of the city known as the Heights. By contrast, densification coupled with transit-oriented development tends to be more compact and land-efficient, and also promotes less traffic-related emissions and building insulation.

Economic Base

The principal employers in Albuquerque and its metropolitan area historically include major defense contractors and high-tech related industries that have contributed to the creation of a strong professional/technical workforce. The University of New Mexico, Sandia National Laboratories, Kirkland Air Force Base, Presbyterian Health Care Services, and Intel Corporation are the principal employers, along with services and a small manufacturing sector. Since 1990, manufacturing employment in Albuquerque in the high-tech sector increased due to the massive expansion of Intel's computer chip fabrication plant and related investments in the Albuquerque area.

Governance Structure

The Mayor of Albuquerque and the City Council are elected to four-year terms. Current Mayor Martin J. Chávez is serving his third term, and the tenure of his position has contributed to the continuity of the programs that have been initiated. Consistency and continuity are important to change and program implementation.

The Office of Emergency Preparedness and its Office of

Emergency Management at the Emergency Operations Center are separate from the Economic Development and Sustainability Office. Coordination between the two offices and the implementation of investment programs and climate change initiatives would benefit from a close working relationship. The city's Environmental Health Department manages and monitors air and water quality. The Albuquerque-Bernalillo County Air Quality Control Board has the authority and responsibility to prevent or abate air pollution in Bernalillo County.

Making "green" purchasing decisions is a city priority. In 2006, the Mayor signed an executive order requiring that purchases of motor vehicles be limited to "alternative fuel vehicles." The city hopes that its green purchasing policies will influence and stimulate markets as well as serve as an example for expanding the use of clean energy fuels, innovative transport technologies, waste-to-energy innovations, and green building products.

II/ PRIORITY HAZARDS/VULNERABILITIES

The city of Albuquerque has identified priority hazards and its vulnerability to a variety of natural and/or technologically caused disasters or emergency situations. Water is the number one issue of concern to the City. The supply of drinking water is vulnerable. Past efforts to deal with this challenge include the San Juan-Chama project, which diverts water from the San Juan River into the Chama River to increase the water supply for domestic use. The development process for this project has been a long one—20 years in the making—with details still be worked out.

Wildfires are the second issue. The city fire department has begun to adapt to the new conditions and initiated mitigation activities to address the fire hazard by clearing underbrush and dry material from the forest areas and parks. Bernalillo County, of which Albuquerque is a part, has prepared a Hazard Mitigation Plan in which the issue of maintenance of wooded areas is dealt with. Areas are being set aside from public access to control the accidental fires that have recently occurred, and volunteer groups are patrolling the areas to control accidental

fire from tourism and camping as well as lightning strikes and other natural causes of fire. Human behavior is the principal source of accidental fires.

Water is the number one issue.

The supply of drinking water is

vulnerable. Wildfires are the second issue.

Vulnerable Populations

According to 2000 U.S. Census data, more than 11,200 families, 10 percent of all families in the city, had incomes below the poverty level. More than 15 percent of all families with children had incomes below the poverty level. Nearly 20 percent of families with children under 5 years old had incomes under the poverty level.

In terms of age, in 2000, 6.9 percent of the population was under 5 years old, 20.0 percent was 5–18, 62.3 percent was 19–64, and 11.9 percent was 65 years old or older. Approximately 36 percent of all families with children were headed by a single parent, and the vast majority of those were single mothers. Families headed by a single mother made up 27 percent of all families with children.

Vulnerable Assets

Historic districts, including Old Town and rural adobe structures, have been put on the Historic Landmarks Survey of Albuquerque. Urban renewal was responsible for past destruction of historic downtown buildings and created an awareness of the need to preserve the remaining old buildings. Increasing transportation costs have also fostered interest in the older areas for their advantages of location, walkability, and proximity to work and cultural amenities. Additional study of the historic building stock is required to determine structural safety and retrofit requirements in response to the potential hazard of extreme climatic events, including heavy snow, wind, and fire.

Business and economic vulnerabilities relate to the dependence on government contracts to maintain the research and military manufacturing in the area. Location is not an issue since floodplains have not been overdeveloped, but flash floods do represent a hazard.

III/ MITIGATION MEASURES

The discussion below identifies a path for local governments to follow as they begin to engage in climate change programs. Selected examples presented in the text were adapted or drawn directly from extensive material available on the city's website, www.cabq.gov.

Making Commitments

Albuquerque participates in plans and agreements that commit it to addressing global warming and climate change impacts through better urban management. By making commitments, the city puts its citizens on notice that the local government is serious about the changes that are to come, and sets benchmarks and targets as well. Illustrative examples of the city's intent include the following:

Land Use

In 1993 the New Mexico legislature passed the Development Fees Act, which allows municipalities and counties to enact impact fees, but which also requires the generation or compilation of data related to population growth forecasts. In late 1994, the city council adopted the land-use assumptions that had been developed as a part of the process of studying and projecting development impact fees.

Alternative Fuels

In 1994, the city of Albuquerque joined with the Department of Energy Clean Cities Program, which develops public/private partnerships to promote alternative fuels and vehicles, fuel blends, fuel economy, hybrid vehicles, and idling reduction.

Planned Growth Strategy

Albuquerque, together with Bernalillo County, issued the Planned Growth Strategy. The Strategy, the result

of a four-year effort by a team of planning, engineering, legal, and finance consultants together with key city and county staff, was adopted into law through four bills. The major goal of the Planned Growth Strategy is to create an efficient and resilient built environment, especially addressing land use in Albuquerque. The Strategy comprises an urban growth land use plan, zoning and design guidelines using Traditional Neighborhood Development principles, and financial requirements for infrastructure to address needs for rehabilitation, maintenance, and growth. The Strategy also states that it will assess development impact fees and provide guidance to ensure that adequate infrastructure and community facilities, including parks and schools, are available to support new development; transportation linkages; housing affordability; legally defined planned communities in the comprehensive plan reserve and rural areas; joint city-county coordination; and regionalisms.

Resolution 329

Resolution 329 establishes a citywide renewable energy source. The resolution substantiates the city's commitment to energy efficiency and the actions required for results.

The U.S. Conference of Mayors Climate Protection Agreement

At the annual meeting of the New Mexico Municipal League in August 2006, Mayor Chávez encouraged 103 other New Mexico mayors to join Albuquerque in signing the U.S. Conference of Mayors Climate Protection Agreement. The group voted unanimously to support the agreement for climate protection and reduced greenhouse gas emissions. The mayor is also a member and co-chair of the U.S. Conference of Mayor's Urban Water Council and was part of a group of mayors from across the country who issued the bi-partisan Mayors Statement on Global Warming.

The 2030 Challenge, Energy Conservation Code, and Green Building Standards

In 2006, the U.S. Conference of Mayors approved a resolution, cosponsored by Mayor Chávez, to adopt the 2030 Challenge.¹ The 2030 Challenge calls for an immediate 50 percent reduction in fossil fuel energy consumption in new and renovated buildings, and challenges

the construction industry to become carbon-neutral by 2030. In 2007, Albuquerque adopted a revised Energy Conservation Code that aims to reduce greenhouse gas (GHG) emissions by requiring new buildings, and existing buildings undergoing alterations, to be more energy efficient. Through an Executive Order Albuquerque established high-performance green building standards for city projects. This was the first step in creating a Green Path Program.

Mayor Chávez encouraged 103 other New Mexico mayors to join Albuquerque in signing the U.S. Conference of Mayors Climate Protection Agreement.

Promoting Learning

The City Council and the Mayor's office have invested time, energy, and resources in promoting learning about climate change. The learning curve included technical support to establish an information base for policy and program development, outreach to new partners and structured consultations to inform and be informed. Learning through local associations, such as the New Mexico Municipal League, is a potent tool for scaling up awareness and creating new partners for action. Events sponsored by the City include the following:

- The first-ever regional air quality stakeholders' summit and an "Air Knows No Bounds" campaign;
- Albuquerque's first Technology Summit to promote innovation and economic development; and
- The Sustainable Energy Town Hall.

Setting Priorities

Albuquerque has identified a set of priorities based on its learning and its association with local, national, and international organizations to determine a way forward. The city sets an example of change and identifies the resources needed to build in efficiencies and new technolo-

gies to reduce global warming and the hazards it may effect. Albuquerque's program and priorities include the following:

Efforts to Secure a Safe Water Supply

In a high desert environment, secure and safe water is among the most important issues facing society. The quantity and quality of the water provided is to be assured, as is the use of that water and the support of citizen behavior change to become responsible water users.

Greenhouse Gas Reduction

Albuquerque is part of the U.S. Conference of Mayors Climate Protection Agreement, which commits to reducing greenhouse gas emissions to levels 7 percent below 1990 levels as a start.

Renewable Energy and Biofuels

The city is committed to save energy and educate citizens and employees in managing energy. Leadership directed that the city function in a new way, one that operates to make services energy efficient and run by other than fossil fuels. One example is the near-term, effective, and visible change that has retrofitted traffic signals by replacing incandescent fixtures with light-emitting diodes (LED). The LED lighting in traffic signals uses 90 percent less energy, lasts more than ten times as long (100,000 hours), and shines brighter.⁷

Urban Forestry

Albuquerque has a priority to create open-space lands to preserve a high quality of life; steps in that direction have made its Bosque Park area safe and green, created carbon sinks, and beautified the city. This, combined with the landscaping mandate for plants that are local and require little water, is both reducing global warming and working to create a water secure city.

Alternative Transportation

Transportation options influence land use, facilitate a healthy economy, clean the air, and reduce traffic. The city has invested in alternative energy fuels for bus service, created bike paths, and encouraged public modes of transport to limit the use of fossil fuels. Albuquerque, with support from planners and community groups, has

made the connection between good planning and the community's health, creating and maintaining safe, attractive, and accessible walking environments.

Waste Reduction and Recycling

The city of Albuquerque initiated user-friendly recycling activities to educate the public on why recycling is important and how easy it can be to recycle. The city has set up a residential curbside recycling program and created three drop-off convenience centers for recycling. The recycling effort is part of a plan to limit landfills and the methane gas that landfills produce. Methane is a significant contributor to global warming.

Waste has a direct impact on global warming. Organic materials slowly decompose and release methane gas, a global warming pollutant 21 times more powerful than carbon dioxide. Municipal solid waste landfills account for more than one-third of human-related methane emissions in the United States. Cities can limit their need for and use of landfills by recycling waste and thereby limiting the amount being sent to landfills and by using the methane gas as a fuel. Technologies now exist to make effective and commercially viable use of methane gas.

To provide a sense of scale, according to the U.S. Environmental Protection Agency, there are more than 395 landfill gas capture projects in the country and nearly 600 municipal landfills that could qualify for a methane capture retrofit. The potential for electricity production at the remaining landfills would be sufficient to provide power to 900,000 homes.

Energy Conservation

Saving energy means converting old technology and being smart in how the city manages itself. It is the city that once again will set the tone for the business community and the domestic use of energy-efficient devices by converting to efficient-energy lightbulbs, heating and air conditioning, solar inputs and natural light solutions, among others, to reduce energy consumption.

Green Building

City government will also lead the way in setting green standards and providing financial incentives for busi-

nesses to build green. Green building is the practice of increasing the efficiency of new buildings and reducing their impact on human health and the environment through better site location, design, construction, operation, maintenance, and removal. These priorities were established through understanding and consensus with the public.

The LED lighting in traffic signals uses 90 percent less energy, lasts more than ten times as long (100,000 hours), and shines brighter.

Partnerships and Collaboration

Albuquerque recognizes its advantage in creating and continuing working partner relationships to accomplish goals of mutual interest; for example:

- The city has established management systems that support improvement processes by developing community partnerships with the Albuquerque community at large and oversight agencies;
- The Mayor's E-Team enhances implementation of sustainability initiatives within the city government and the community;
- Albuquerque is an active member of the U.S. Department of Energy's Clean Cities program;
- The Office of Economic Development carried out a Sustainable Legacy Plan to implement and track the programs proposed to assure success of the Sustainable Resource Analysis;
- The city coordinates with the Indicators Progress Commission to report on citywide sustainability measures;
- The city also coordinates with the Energy Council on energy conservation initiatives;
- Albuquerque/Bernalillo County Air Quality Control Board oversees air quality issues; and
- Ground-Water Protection Advisory Board over-

sees implementation of the Albuquerque/Bernalillo County Ground-Water Protection Plan.

Emergency Operations and Disaster Risk Management

Albuquerque's hazards include floods, fires, water security, drought, and extreme weather events, including ice storms, heavy snows, and flash floods. To confront these hazards the Office of Emergency Management was established. The local government structure could seek to build closer relations with the Sustainability Office and the programs it manages for the city to reduce global warming. The climate change impacts may create more frequent and more intense events such as wildfires and flash floods, harsher winters with more snow, and erratic precipitation patterns that will affect water security.

Perhaps the most interesting example of the priorities established in Albuquerque for emergency management is the role of the community and the neighbor-helping-neighbor approach. This is a critical part of the all-hazards approach the Office of Emergency Management carries out to deal with the city's hazards.²

Community Volunteers and Responsibilities

Community participation is an important part of the Emergency Management program. How local governments perceive their citizens is an evolving image. From the usual "beneficiary" position that had made "victims" of all affected families, the new position is one that is now creating partnerships with and offering training and support to community groups able and willing to take on response, education, and recovery responsibilities. Volunteer groups are being recognized only now as essential to overall response and the 72-hour period of response just after an event.

Local government partnerships with their communities are excellent opportunities to build a working relationship with their citizens, get information out on climate change and disaster impacts and issues, and gain coverage for response and recovery activities. The Medical Reserve Corps and Community Emergency Response Team (CERT) programs are two effective community-

based, on-going programs in Albuquerque. The roles of the Medical Reserve Corps and the Community Emergency Response Team in the city's Climate Change Programs could be even larger since their outreach activities are a critical part of their work. To date the city's Climate Change Initiatives have not made use of the community groups.

The Community Emergency Response Team and Medical Reserve Corps are part of the Emergency Management training program. The Community Emergency Response Team has 200 members who have gone through CERT training. The CERT programs feature training-of-trainers for its members. The Emergency Operations Center has a clear message: "In the face of a major disaster or climate event Government will not be there for you. You are the first responders."³

Financing Activities

In setting its priorities, Albuquerque looks to its domestic capital market for financing its programs and its services to supplement and complement its budget derived from taxes, user fees, and national and state grants for targeted projects. This provides the opportunity for local government to better plan and implement because it can count on a reliable and consistent resource stream. This Primer strongly suggests that local governments learn more about municipal finance and develop the capacity to prepare and implement "commercially viable" climate change and hazard management capital projects. In introducing the 2007 General Obligation Bond Program and the 2007–2016 Decade Plan, Albuquerque goes to great lengths to educate its population as to what a bond is, why it is useful, and the purposes to which it will be applied.⁴

The financial incentives in the form of rebates are another means of encouraging the public to "Go Green" in Albuquerque. Water rebates for water efficiency, as well as facilitated building permits for green building projects, represent money to the builder. Water rebates, given for converting to modern, efficient appliances and fixtures, would cover low-flow toilets, low-water use washing machines, hot water recirculating systems, rainwater harvesting barrels, and multi-setting sprinkler timers.

IV/ OUTCOME AND IMPACT

The city government has taken a leadership position as the example for the community to initiate change at home and for the business community to engage in and practice green building practices and behavior change. The following accomplishments represent Albuquerque's actions taken to advance the city's agenda.

Efforts to Secure a Safe Water Supply

Accomplishments include the following:

- Secured a sustainable water supply by implementing the San Juan–Chama water project in 2003. Since 1963, city leaders and water customers have invested more than \$50 million in the San Juan–Chama water project to ensure a sustainable water supply for Albuquerque.
- Exceeded goal of reducing water usage in Albuquerque by 30 percent in 10 years. The Southside Water Reclamation Plant is treating and recycling wastewater for irrigation. The Rio Grande Zoo is supplied with recycled water, and older parks now have water meters to better manage the irrigation of plants and green areas.
- In a water-scarce region, the city took the lead in starting a xeriscaping rebate program for homes and businesses (including golf courses). In xeriscaping, only plants with low water-use requirements are used.
- Started a low-flow appliance rebate program. Low-flow fixtures have been installed in community Centers and nearly 300 public housing units.

Renewable Energy and Biofuels

The goal of the effort is to reduce Albuquerque's dependence on petroleum-based fuels like gasoline. The use of biofuels, ethanol, and electricity to power city mass transit and service vehicles is now mandated by the city. Accomplishments include:

- Succeeded in converting 20 percent of city's energy to wind power.
- Established Executive Order 19, which directs that all city motor vehicles shall be limited to al-

ternative fuel vehicles, effective March 1, 2006.

- Upgraded the entire city fleet including buses, police cars, fire trucks, and maintenance vehicles to use alternative fuels. Forty-five percent of all city vehicles are alternative-fuel ready:
 - 1,200 vehicles are capable of using biodiesel,
 - 364 vehicles are capable of using E85 ethanol,
 - over 100 light vehicles use compressed natural gas (CNG),
 - 34 hybrid light vehicles are in use,
 - 84 CNG buses and 12 diesel electric hybrid buses are part of the ABQ Ride bus fleet,
 - airport rental car shuttles use CNG.
- Established four city fueling stations to dispense CNG.
- Mandated that all main fueling stations for the city dispense B-20 biodiesel.
- Instituted the use of Segway Personal Transporters by city Police, city Security, and Parking Division.
- Instituted the use of CNG Honda Civics.
- Partnered in the Million Solar Roofs program and received a Best Progress award from the Department of Energy in 2005.
- Implemented a program to convert landfill gas to energy at Los Angeles landfill in Albuquerque. Excess electric power is sold to local utility company.
- Implemented a program at the Southside Water Reclamation Plant to use anaerobic digesters to convert organic waste removed during the sewage treatment process into fuel (methane gas). This has resulted in an estimated savings of \$2,000,000 per year in avoided electricity purchases.

Planting and Maintaining Trees

Since 1983, the Open Space Division has planted over 23,000 cottonwood and willow trees in the Rio Grande Bosque (forest). Accomplishments include:

- Albuquerque has been a leader in Open Space Acquisition through legislation leading to the acquisition and preservation of over 4,000 acres of public open space.
- In 2005, the city spearheaded efforts to save 250

acres of land along the Rio Grande Bosque from private development.

- Massive restoration effort in the Albuquerque Rio Grande Bosque, including a comprehensive exotic-species eradication to produce a safer and healthier Bosque ecosystem.
- In 2004, the city launched a major Urban Forest Improvement Initiative. The mayor commissioned the development of the city Urban Forest Master Plan, Tree Protection and Technical Manual, and a complete park and median tree inventory. This inventory is complete. The initiative includes having an urban forestry program to regulate and manage the city's 160,000 trees; hiring of a full-time city forester; and funding to plant 2,000 trees per year in Albuquerque.
- For 10 years now, the city has coordinated an ongoing program of "adoption" and volunteer projects to plant native tree and shrubs in the Bosque. This has resulted in tens of thousands of new, successful native trees and shrubs.
- Received an award from the National Arbor Day Foundation for tree care efforts by Albuquerque's Open Space Division.

Alternative Transportation

The city has made the following progress to create alternative transportation options in Albuquerque:

- Launched Rapid Ride bus system that operates twelve 60-ft articulated buses;
- Launched downtown shuttle bus (D-Ride) that connects commuters to RailRunner train and other bus routes;
- Launched Albuquerque-Rio Rancho connection to the NM RailRunner;
- Launched trolley system from downtown to Old Town;
- Created Bike & Ride program to encourage cycling in conjunction with public transportation;
- Created and promoted one of the most extensive Bike Trail Systems in the country. In 2006, Albuquerque was named one of "The 21 Best Cities for Cycling" in America by *Bicycling Magazine*; and
- Launched Dump the Pump! Ride the Bus! The

Encouraging the public to "Go Green" in Albuquerque—Water rebates for water efficiency, as well as facilitated building permits for green building projects, represent money to the builder.

city operates 148 buses and 46 paratransit vehicles. In July 2005 to July 2006, 8.58 million passengers boarded buses.

Waste Reduction and Recycling

A comprehensive recycling program includes curbside pick-up, centers for drop-off recycling, and bins throughout the city. Each Albuquerque resident throws away nearly five pounds of trash every day, or almost one ton each year. Recycling, along with reducing and reusing the trash is an important component in the effort to preserve natural resources and reduce pollution. In addition to recycling at home, Albuquerque encourages its citizens to be proactive and offers them guidance on how to recycle so that trash can be processed.

Energy Conservation

In 2007, the city adopted a revised Energy Conservation Code, which aims to reduce GHG emissions by requiring new buildings, and existing buildings undergoing alterations, to be more energy efficient. The code applies to commercial buildings, multi-family residential buildings such as apartments, and single-family dwellings, and requires the following:

- Commercial and multi-family residential buildings to be 30 percent more energy efficient than in the past;
- Single-family dwellings to use substantially more insulation, which reduces energy waste by making the most of heating and cooling;
- Single-family dwellings to use more efficient heat-

ing, cooling, ventilating, water heating, and lighting systems; and

- Commercial, multi-family, and single-family buildings to pass Thermal Bypass Inspections, which are designed to inspect insulation installation and ensure “tighter” buildings with less air leakage.

Energy conservation accomplishments include:

- Converted 575 traffic signals in Albuquerque to LED technology. When conversion is complete, this will result in an energy savings of 12,000,000 kilowatt-hours and a financial savings of \$900,000 per year.
- Continued energy audits continue on municipal facilities.
- Converted outdated lighting at city hall, parking structures, police substations, fire stations, and community centers to modern, more efficient lighting technology. This has resulted in an energy savings of 5,000,000 kilowatt-hours and a financial savings of \$375,000 per year.
- Enacted legislation to set aside 3 percent of city bond revenues for energy conservation and renewables. This legislation passed the City Council in September 2006. The program starts in fiscal year 2007 and continues through 2011.

Alternative Energy Usage

The goal is to reduce dependence on foreign oil by taking advantage of alternative energy sources like solar power, wind power, and biofuels. Accomplishments include:

- The city of Albuquerque currently has 84 CNG buses and 12 diesel electric hybrid buses in its ABQ Ride bus fleet.
- By the end of 2006, the city will have 6 new diesel electric hybrid Rapid Ride buses. Next year, about 35 old diesel buses will be replaced with diesel electric hybrids.
- All city buses have bicycle racks mounted on front bumpers.
- The city provides free parking at city meters to hybrid vehicles.
- Installing solar heating and photovoltaic systems

in five city swimming pools to heat the pools and power the pumps.

- Methane gas is being collected and used at both the Cerro Colorado landfill and the Los Angeles landfill. The collection efforts have resulted in a reduction in GHG emissions.
- City facilities already run on 20 percent wind power.

Albuquerque is a partner in the Million Solar Roofs program and received a Best Progress award from the Department of Energy in 2005.

Green Building

Constructing and maintaining office, government, and residential buildings requires a significant amount of energy and produces a significant amount of greenhouse gases. The city is committed to building only energy-efficient buildings in the future. The city’s accomplishments include:

- Established green building standards for all building projects funded by the city, including requirements to meet or exceed U.S. Green Building Leadership in Energy and Environmental Design.
- In September 2005, directed city agencies to work with private industry to recruit “green building supply industries” to Albuquerque.
- In June 2006, Albuquerque took a central role in Resolution No. 50, which urged the U.S. Conference of Mayors to adopt the 2030 Challenge designed to decrease the amount of fossil fuels used by the building sector. Their goal is that the building industry become carbon-neutral by 2030.

Notes

This “City Profile” is part of *Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters*, published by the World Bank. The analysis presented here is based on data

available at the time of writing. For the latest information related to the Primer and associated materials, including the City Profiles, please visit www.worldbank.org/cap/climatecities. Suggestions for updating these profiles may be sent to climatecities@worldbank.org.

¹ http://www.architecture2030.org/2030_challenge/index.html.

² For more details about the Office of Emergency Management programs go to www.cabq.gov/emergency.

³ More information on Community Emergency Response Team and Medical Reserve Corps is found in the city web site.

⁴ Albuquerque has had its bond issues rated receiving a City Bond rating in 2007 of AA by the Fitch Rating Agency. Credit and bond rating are important to not only allow access to the domestic capital market and give also comfort levels to investors, but the rating activity itself identifies areas for a city to improve its financial management and project development capacity to be able to raise capital in the bond market. A city cannot “fail” a credit rating exercise if it perceives the effort to be one to improve its urban financial management capacity.

The bond was approved for the 2007 General Obligation Bond Program and 2007–2016 Decade Plan capital improvements. The effort to explain the purpose of the bond is essential to the public’s approving the bond issue and taking on the financial commitment a bond represents.

The General Obligation Bond Program for 2007 was established by R-06-21; Enactment 2006-039 at a minimum of \$142 million, including a \$9 million set-aside for Council-Neighborhood-initiated projects. During the planning period, it was determined that the city’s general obligation bond capacity has increased to \$160 million, including Council-Neighborhood Set-Aside; 1 percent for Impact Fee Reductions; 3 percent for energy conservation; and 1 percent for public art. The current value of the approved general obligation bond program is \$149,387,000. When 1 percent for Public Art and Council-Neighborhood Set-Aside are added to the Mayor’s recommendation, the total proposed General Obligation program will be \$159,973,000. Departments submitted approximately \$224 million in project requests for the general obligation bond program. In order to conform to the available funding, many city projects were reduced or deferred to out-years.



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