

# DISASTER RESPONSE: PLANNING + REBUILDING

TOOLKIT VERSION 1.1

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2011

# ACKNOWLEDGEMENTS



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CURIS addresses critical issues unique to the rural communities in Louisiana, Mississippi, Alabama, and Florida located along the northern Gulf of Mexico region.



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**THIS DOCUMENT  
IS ABOUT  
UNDERSTANDING  
NATURAL DISASTERS  
& USING SUSTAINABLE  
SMART GROWTH  
PLANNING AND  
DESIGN PRINCIPLES TO  
TRANSFORM TRAGEDY  
INTO REBUILDING  
OPPORTUNITY.**

# INTRODUCTION

**UNFORTUNATELY, AFTER MOST DISASTERS, COMMUNITIES CAN NOT MAKE THE TRANSITION FROM EMERGENCY SURVIVAL TO LONG TERM THRIVING. UNINFORMED SHORT-TERM REBUILDING DECISIONS CAN BE MADE THAT HAVE SIGNIFICANT NEGATIVE IMPACTS FOR GENERATIONS TO COME. ON THE OTHER HAND, A DISASTER CAN BE AN OPPORTUNITY TO REBUILD THE COMMUNITY IN A NEW WAY THAT HAS THE POTENTIAL TO BE MORE LIVABLE THAN IT WAS PRIOR TO THE DISASTER.**

This “Toolkit” consists of best practices and strategies meant to be applicable to communities affected by all types of natural disasters. This “Toolkit” is also intended to be an easily transferable and replicable model to be used by any community in the country or the world to guide the response and rebuilding after a natural disaster.

# WHAT IS THE DRPR TOOLKIT FOR?

**THIS TOOLKIT IS NOT INTENDED TO GIVE INSTRUCTION TO EMERGENCY AID WORKERS, AS THEIR WORK IS UNDERTAKEN DURING THE EMERGENCY PHASE AND IS FOCUSED ON PROVIDING IMMEDIATE NECESSITIES OF LIFE AFTER THE DISASTER. THIS TOOLKIT IS CREATED PRIMARILY FOR USE AFTER THE EMERGENCY PHASE, WHEN IMMEDIATE NECESSITIES OF LIFE HAVE BEEN RESTORED.**

Nor is this Toolkit intended to be a comprehensive source for data, analysis or statistics about disasters. That information is thoroughly documented by the National Oceanographic and Atmospheric Administration, which provided the grant to make this publication possible, as well as the Mississippi State University Center for Urban Rural Interface Studies (CURIS) and many other sources. That type of information can be located at [www.noaa.gov](http://www.noaa.gov) and [www.curis.msstate.edu](http://www.curis.msstate.edu).

**INSTEAD, THIS TOOLKIT IS INTENDED TO BE A SOURCE FOR CONCEPTS, IDEAS AND PRINCIPLES RELATED TO PLANNING AND REBUILDING AFTER A DISASTER HAS OCCURRED.**

# HOW TO USE THE DRPR TOOLKIT?

**THE DRPR TOOLKIT HAS BEEN DESIGNED TO BE READ AS A SINGLE COHERENT NARRATIVE WHICH FOLLOWS THE STAGES OF RESPONSE AND REBUILDING FOLLOWING A NATURAL DISASTER.**

At the same time, the document works as its name implies, as a kit of tools, each able to be singled out and utilized individually. Some tools are ideas or principles and others are specific implementable strategies or methodologies.

While the entire toolkit will be useful to all communities regardless of their particular rebuilding interests, certain elements may be more or less relevant depending on the type and/or scale of the disaster. We anticipate the DRPR Toolkit will have three main applications. At the beginning of the rebuilding process, the DRPR Toolkit can serve as an idea source book for inspiring your community. It is also a guide through the difficult process of planning and rebuilding. Finally, it can serve as a basic framework upon which a comprehensive master plan for the future can be based.

All feedback should be sent to the following addresses or email addresses:

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# OVERVIEW OF THE DRPR TOOLKIT:

**THE TOOLKIT IS ORGANIZED INTO 2 MAIN SECTIONS THAT ARE BASED ON THE STAGES OF ACTION FOLLOWING A DISASTER: THE SHORT-TERM SURVIVAL PHASE THAT BEGINS IMMEDIATELY AFTER THE EMERGENCY PHASE HAS RESTORED CRITICAL BASIC HUMAN NEEDS – (THE “SURVIVE PHASE”), AND THE LONG-TERM RESPONSE (THE “THRIVE PHASE”).**



## **IMMEDIATE RESPONSE (“SURVIVE PHASE”)**

The Immediate Response Phase is comprised of those tasks that take place immediately following a disaster and after critical basic human needs have been met.



## **LONG-TERM RESPONSE (“THRIVE PHASE”)**

The Long-Term Response Phase is comprised of those tasks primarily concerned with the long-term wellbeing of a community. These tasks are primarily achieved over longer periods of time and have far-reaching effects on community viability and stability.

# WHO SHOULD USE THE DRPR TOOLKIT?

**COMMUNITY LEADERS, EDUCATORS, CITIZENS,  
BUSINESS PEOPLE, CIVIC ORGANIZATIONS,  
RELIGIOUS GROUPS, PLANNING STAFF, PLANNING  
COMMISSIONS, LOCAL LEGISLATORS, SERVICE  
ORGANIZATIONS, CHAMBERS OF COMMERCE,  
ECONOMIC DEVELOPMENT AUTHORITIES,  
POLICE, EMERGENCY MEDICAL PROFESSIONALS,  
FIRE DEPARTMENTS, CITY ENGINEERS, HEALTH  
PROFESSIONALS, ETC.**

## SUMMARY

Following a disaster, a community needs to survive not only physically but also emotionally. To emotionally survive, community members affected by the disaster need a purpose. This purpose can come from the creation and implementation of a plan for the future. Unfortunately, after a disaster, communities often have a difficult time making the transition from emergency survival to thriving long term. Short term rebuilding decisions can be made that have significant negative impacts for generations to come.

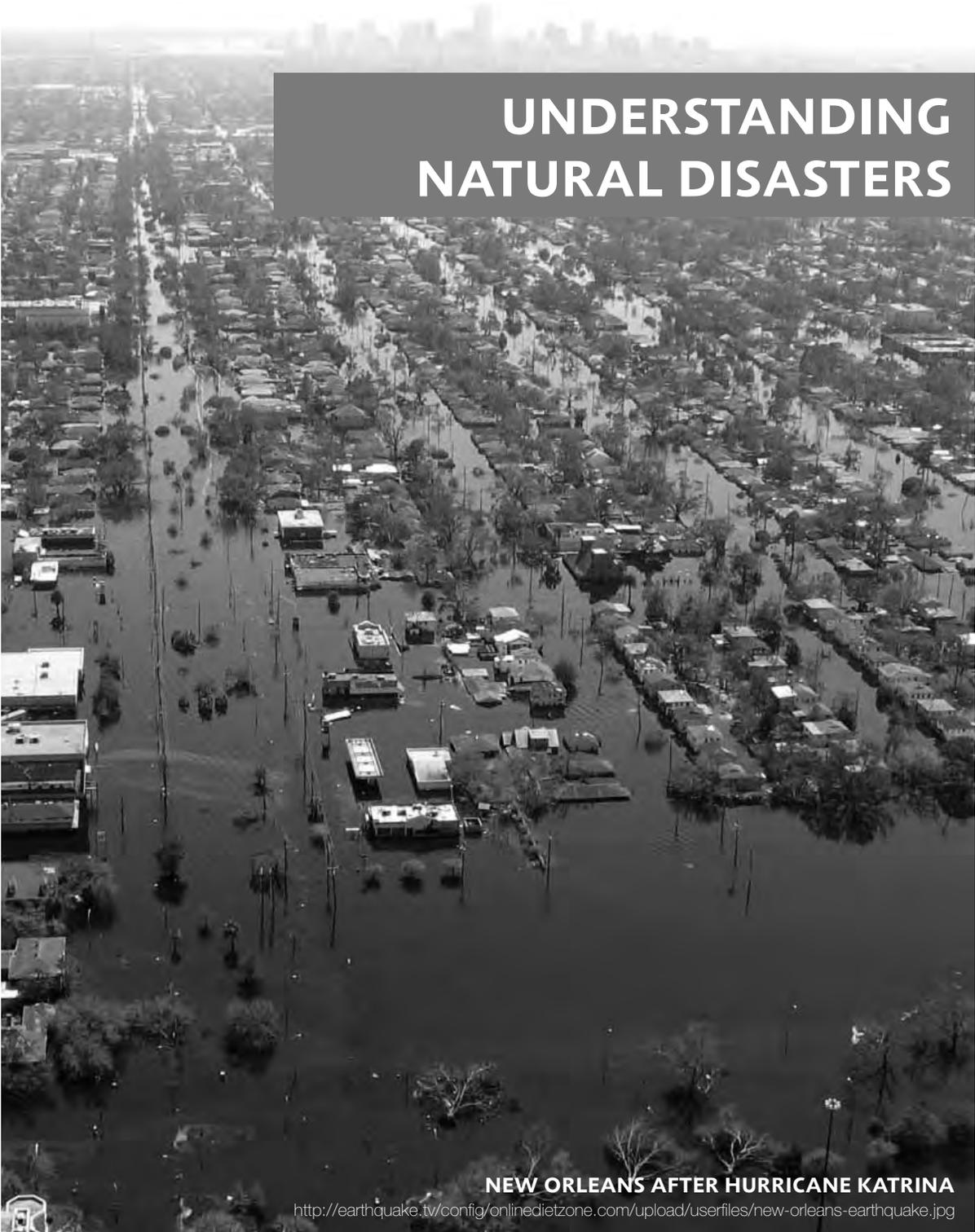
**“The Toolkit will assist planners, elected officials and citizens in developing proactive and preventative planning strategies, emergency response strategies, and rebuilding strategies for municipalities faced with a natural disaster.”**

On the other hand, a disaster can be an opportunity to rebuild the community in a new way that has the potential to exceed the livability of the community prior to the disaster. This publication has been developed in order to assist communities in capitalizing on the opportunity a natural disaster can create, .

The DRPR Toolkit acts as a best practices guide for communities in areas prone to natural disasters so that they may proactively plan to minimize damage and effectively recover from a disaster. Serving as a national and international model, the “Toolkit” is a guide for disaster preparedness and response for planners, elected officials and citizens.

Consisting of guidelines, best management practices and strategies, the DRPR Toolkit is meant to be applicable to all types of natural disasters, but is focused on hurricanes, tornadoes, earthquakes, wildfires, and flooding. The DRPR Toolkit is also intended to be an easily transferable and replicable model to be used by any community in the country or the world to guide the response and rebuilding after a natural disaster.

The Toolkit will assist planners, elected officials and citizens in developing proactive and preventative planning strategies, response strategies, and rebuilding strategies for municipalities faced with a natural disaster. These strategies will touch upon numerous aspects of planning including sustainability, urban form, infrastructure, utilities, transportation, and economic development.



# UNDERSTANDING NATURAL DISASTERS

**NEW ORLEANS AFTER HURRICANE KATRINA**

<http://earthquake.tv/config/online/etzone.com/upload/userfiles/new-orleans-earthquake.jpg>

# THERE ARE TWO TYPES OF NATURAL DISASTERS

**METEOROLOGICAL DISASTERS: THOSE DISASTERS CAUSED BY A ATMOSPHERIC EVENT/ WEATHER RELATED (I.E. THUNDERSTORMS, TROPICAL CYCLONES, HURRICANES, TORNADOES, FLOODING, TSUNAMIS, ETC.)**

**GEOLOGICAL DISASTERS: THOSE DISASTERS CAUSED BY FORCES THAT EXIST BENEATH THE SURFACE OF THE EARTH AND HAVE NO CONNECTION WITH THE WEATHER (I.E. EARTHQUAKES)**

## METEOROLOGICAL DISASTERS

### INTRODUCTION

In order for those affected by a natural disaster to begin to comprehend what has happened, it is important to understand the basic elements of the disaster that impacted their lives. Both hurricanes and tornadoes are caused when air temperatures, air currents, and cloud formation occur in such a way so as to create a powerful storm. To understand how these storms begin, it is important to first understand a little bit about clouds and thunderstorms.



## **INTRODUCTION**

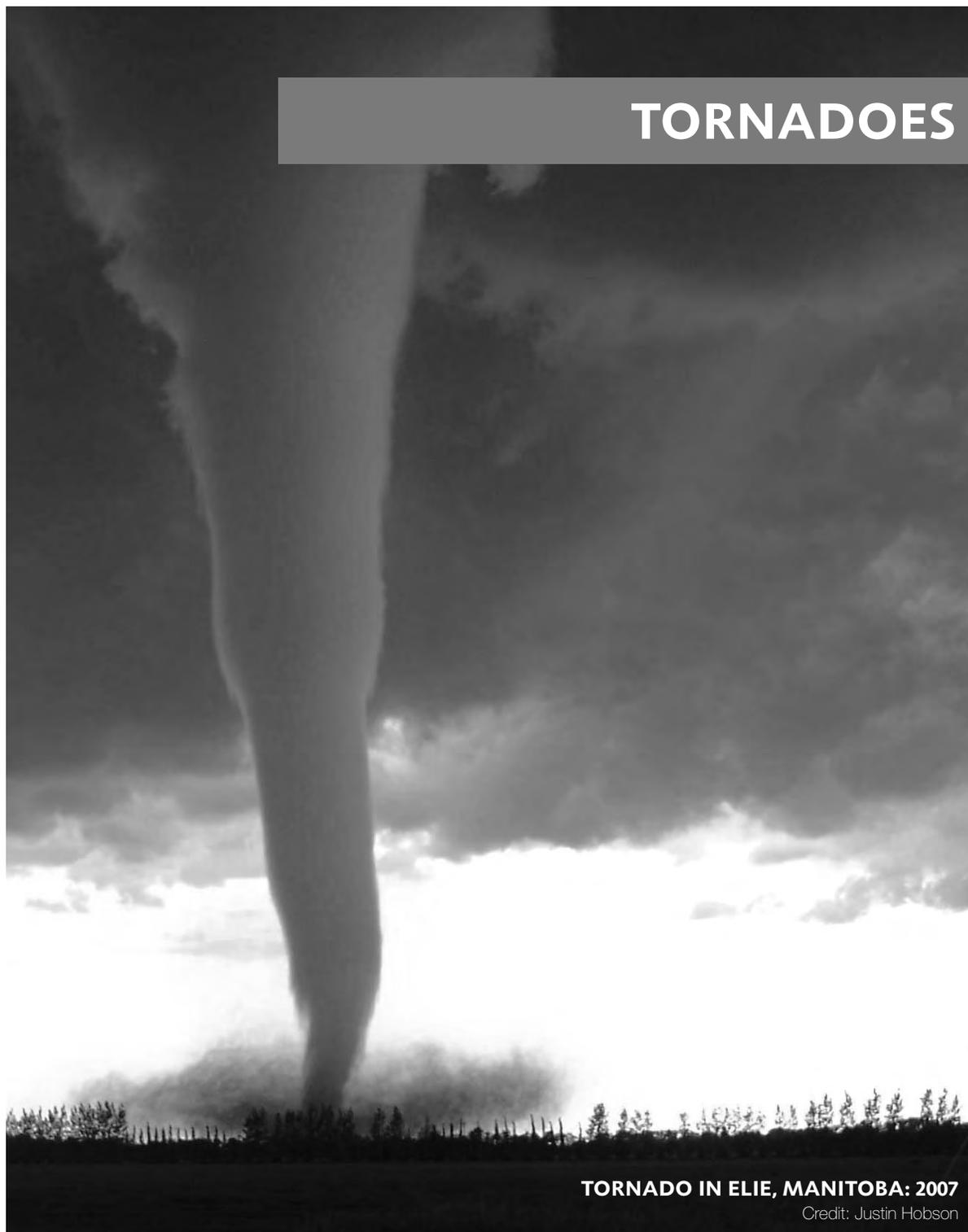
The atmosphere is a thick layer of gases that surrounds the earth. It is made up of several levels, including the four to twelve mile thick lower level called the troposphere. It is in this layer that clouds form. Changes in temperature, water vapor, and air current effect the formation of different types of clouds, some of which can develop into severe weather phenomena.

There are four main types of clouds: high-level clouds including cirrus, cirrocumulus, cirrostratus and contrail; medium-level clouds including altostratus and altocumulus; low-level clouds including stratocumulus, nimbostratus and cumulus; and vertically-developed clouds known as cumulonimbus.

It is the tall, dense cumulonimbus clouds that cause thunderstorms and intense weather phenomena. Cumulus clouds grow vertically as warm air rises to meet cooler air. These clouds can be several miles wide and tens of thousands of feet tall, often found at the edge of cold fronts. Conditions inside these clouds often lead to rain, thunder, lightning, and hail. Hail is produced when air currents within the cloud carry ice droplets up and down, gathering additional layers of ice until the hailstone becomes too heavy for the vertical movement of air to hold them aloft, at which time they fall to the ground.

In extreme cases, cumulonimbus clouds can develop into super cells – a type of thunderstorm characterized by a rotating updraft. These are typically 2 to 6 miles wide, and once they form, there is an approximately 50 percent chance that the storm will become a tornado within thirty minutes. Super cells are the least common type of thunderstorm but have the most potential for severe damage.

# TORNADOES



**TORNADO IN ELIE, MANITOBA: 2007**

Credit: Justin Hobson

## TORNADOES

### OCURRENCE AND PREDICTION

Most tornadoes occur in North America, however, they can happen on any continent but Antarctica. The very specific weather conditions required for the formation of a tornado are most common in the Midwest United States; specifically Kansas, Oklahoma, and Missouri. This region is commonly referred to as “Tornado Alley,” and is the area where cold air from Canada moves in on top of warm, moist air from the Gulf of Mexico. Several hundred tornadoes occur every year in Tornado Alley, mostly in the summer. The majority of these tornadoes occur in the late afternoon, around 3:00PM.

The time and location at which a tornado will occur is extremely difficult to predict, though scientists are constantly trying to improve these abilities. Currently, forecasters are only able to issue general warnings when weather conditions are ideal for tornado formation. Weather professionals still rely on trained weather spotters to report sightings. Unfortunately, by the time a tornado is spotted, it is often too late to escape its path.

### DAMAGE

The majority of damage caused by tornadoes is a result of extremely fast-moving, cyclical wind. The updraft of a tornado functions much like a 100 mile-an-hour vacuum cleaner, pulling dirt and debris, sometimes as large as a house, into the funnel. Tornadoes are capable of uprooting trees, ripping houses from their foundations, and lifting large vehicles and machinery. Objects can be found miles away from where they were picked up. Flying debris causes the majority of human injury associated with these deadly storms. Approximately one hundred people per year die in the United States as a direct result of tornadoes.

### TYPES

The majority of tornadoes have a single vortex, but in some cases multiple vortices can be found revolving around a single center. These smaller storms are generally small (about 30’ in diameter) but are still powerful and fast-revolving.

## MEASUREMENT AND CLASSIFICATION

From 1971 to 2007, tornadoes were measured on the Fujita Scale, a system of classification based on wind speed and the type of damage caused, created by T. Theodore Fujita. This original scale had six levels: F0 through F5.

The Enhanced Fujita Scale replaced the Fujita Scale in 2007. This new system has the same number of levels (EF0 through EF5) but employs additional criteria for damage evaluation. “Damage Indicators” are objects that can be damaged in a tornado, ranging from small barns (1) to softwood trees (28). These indicators have eight degrees of damage that can occur, and each of these degrees of damage corresponds to a wind speed.

### TORNADO CLASSIFICATIONS

- EF 0 – Three second gusts of 65-85 mph
- EF 1 – Three second gusts of 86-109 mph
- EF 2 – Three second gusts of 110-137 mph
- EF 3 – Three second gusts of 138-167 mph
- EF 4 – Three second gusts of 168-199 mph
- EF 5 – Three second gusts of 200-234 mph

Note: The three second gust is estimated at the point of damage.



## THE LIFE CYCLE OF A TORNADO

### BEGINNING

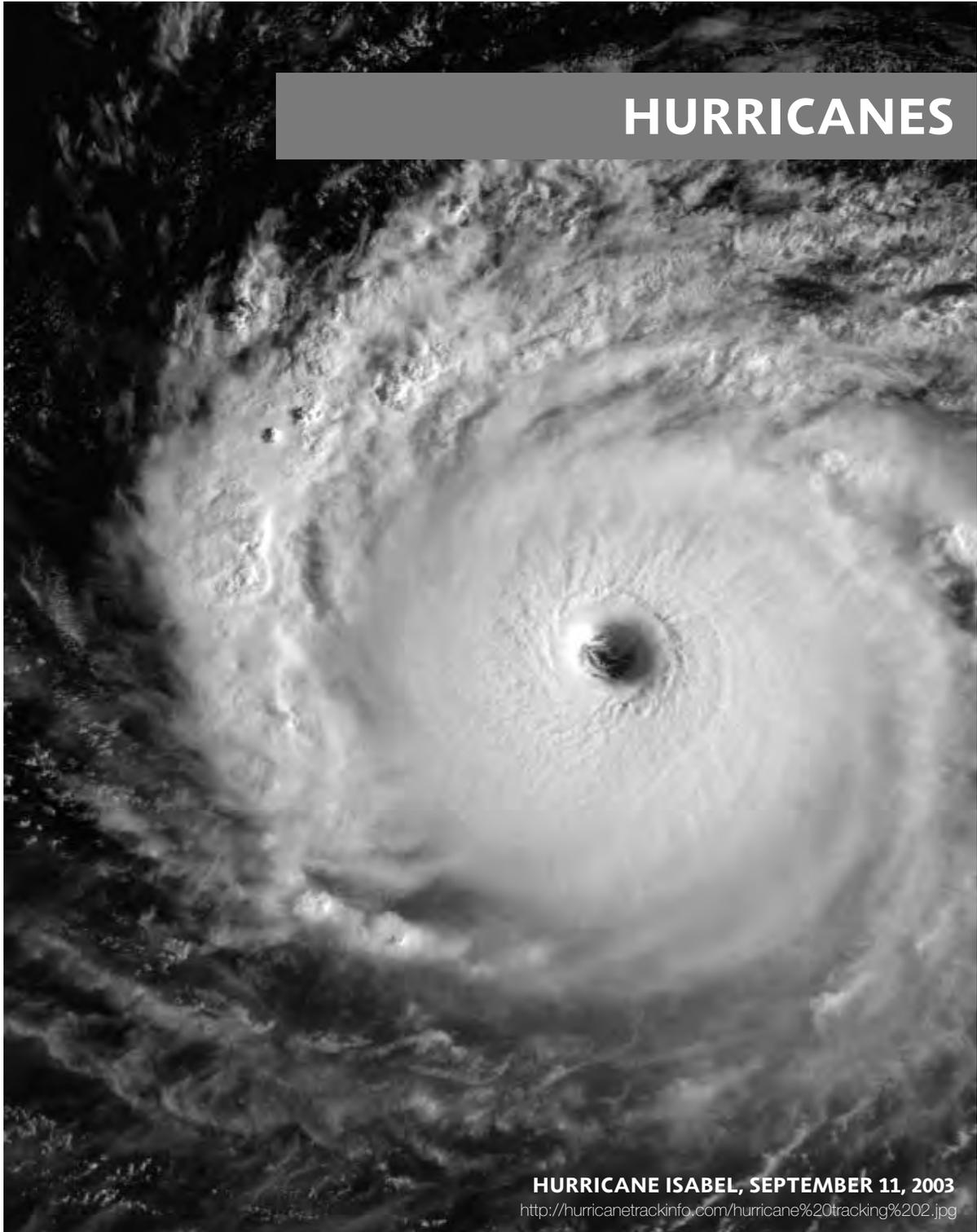
When warm, moist air in a cumulonimbus cloud rises to meet cool, dry air moving in the opposite direction, wind is generated, causing the warm air to spin as it rises. Under the right conditions, these wind speeds can reach up to 300 miles per hour on the surface. In order to be considered a tornado, the spinning vortex needs to touch the ground.

### MOVEMENT

While a tornado is a fast-rotating system, its movement occurs in a relatively straight line. The movement of the parent cumulonimbus cloud controls the movement of the tornado spawned by it. The path of a tornado is usually between one and three miles long and about 160 feet wide, though width can range from 30 feet to one mile. Most tornadoes move at approximately 35 miles per hour, but speeds as fast as 70 miles per hour have been observed in some cases. Extreme tornadoes have been known to remain on the ground for several hours and cover hundreds of miles.

### END

Tornadoes are much smaller and more short-lived than hurricanes, and rely on atmospheric instability and wind rotation to survive. They typically last about five minutes, but can range from a few seconds to an hour. If conditions stabilize or air movement is interrupted, a tornado may dissipate just as quickly as it formed. Tornadoes are often brought to an end when precipitation causes a cold outflow of air, disrupting the balance.



**HURRICANES**

**HURRICANE ISABEL, SEPTEMBER 11, 2003**  
<http://hurricanetrackinfo.com/hurricane%20tracking%202.jpg>

## HURRICANES

The term “hurricane” is used to describe a specific type of tropical cyclone that originates in a specific region of the world. “Tropical cyclone” is the parent term for the types of storm systems characterized by a low pressure center and multiple thunderstorms. Tropical cyclones produce strong winds and heavy rain, and like tornadoes, they occur when warm, moist air rises, resulting in condensation and the release of heat. This heat becomes vertically distributed around the center of the storm, with the inside typically warmer than the outside. Tropical cyclones all originate in warm bodies of water close to the equator, and are referred to by different names depending on the area of origination.

### DAMAGE

Hurricanes are one of the most damaging natural disasters on earth. According to the Insurance Information Institute, between 1986 and 2005, the percentage of total catastrophe losses due to hurricanes and tropical storms was 47.5%.

The damage caused by a hurricane is not always wind-related. Effects can include torrential rain and hail, high waves and storm surge, flash flooding and even tornadoes. The most severe hurricanes, Category 5 on the Saffir-Simpson Scale, are usually identified by the following types of damage:

#### **CATEGORY 5 ON THE SAFFIR-SIMPSON SCALE:**

- Majority of trees and signs blown down
- Extensive structural damage including roofs, windows and doors
- Complete roof collapse or failure on most small to large buildings
- Complete structural failure of most small to medium buildings, and some large buildings
- Some overturning and/or displacement of small buildings
- Complete destruction of mobile homes

It is a common misconception that hurricane activity is on the rise in coastal areas. In actuality, hurricanes are occurring at the same frequency, but the increase in development of these areas provides more structures to destroy.

Of all natural disasters, hurricanes are fortunately one of the easiest to predict using modern meteorological technology. Improvements in prediction and early warning systems have allowed for earlier evacuations and a decrease in the number of lives lost.

**OCCURRENCE AND PREDICTION**

Approximately eighty seven tropical cyclones occur around the world every year. Of these, approximately one third occur in the Northwest Pacific (called typhoons), seventeen percent occur in the Northeast Pacific (called hurricanes) and twelve percent occur in the North Atlantic (also called hurricanes).

Each of the world’s basins has a different peak time and seasonal storm pattern. On average, the most hurricane activity occurs in September, and the least in May. In the Northern Hemisphere, the majority of hurricanes occur between July and October, with a peak date of September 10th. This is usually when water surface temperatures are highest, causing the most evaporation and peak hurricane conditions. In the Southern Hemisphere, the peak is in January and February.



**DAMAGE FROM HURRICANE IKE NEAR HOUSTON, TEXAS**

Credit: Walter Jennings, FEMA Photo Library

Hurricanes begin in tropical waters close to the equator. There is an area of permanent low pressure close to the equator where the trade winds moving across the earth meet. These areas are the most conducive to hurricanes because of the swift updraft of air that is constantly occurring.

The majority of hurricane-related damage is sustained by coastal areas, with inland regions rarely affected. This is because hurricanes lose strength quickly as they move over land, weakening to thunderstorms before they travel far from the coast.

Hurricanes are monitored by satellite and predictions are made for the time and location that the effects of a hurricane will reach populated areas. Most monitoring centers can forecast the path and “landfall” of a hurricane several days in advance. “Landfall” is the term used to describe the moment that the storm’s center crosses the coastline and moves from water to ground. It is important to note that most hurricanes are many miles in diameter, and the edge of the storm may reach the coast several hours before the center makes landfall.

**MEASUREMENT AND CLASSIFICATION**

Tropical cyclones that form in the North Atlantic or Northeast Pacific Oceans are measured on the Saffir-Simpson Hurricane Scale (SSHS). The Saffir-Simpson is the scale with which most Americans are familiar. It was developed in 1971 by a civil engineer named Herbert Saffir; and a meteorologist and former director of the United States National Hurricane Center, Bob Simpson. The Saffir-Simpson scale classifies hurricanes based on their speed and the amount of storm surge caused. Categories range from 1 to 5, with 1 being the weakest and 5 being the strongest as follows:

**HURRICANE CATEGORIES**

- Category 1 – weak/74-94 mph/3.9-4.9 ft surge
- Category 2 – moderate/95-109 mph/5.0-7.8 ft surge
- Category 3 – strong/110-130 mph/7.9-12.1 ft surge
- Category 4 – very strong/131-155 mph/12.2-18.0 ft surge
- Category 5 – devastating/over 155 mph/over 18.0 ft surge

## THE LIFE CYCLE OF A HURRICANE

### BEGINNING

A tropical cyclone begins as a “tropical depression” with maximum sustained winds at the water’s surface of less than 39 miles per hour. When wind speed exceeds 39 miles per hour, it is reclassified as a “tropical storm.” Once wind speeds reach 74 miles per hour or greater, the storm is officially termed a “hurricane,” “typhoon,” “severe tropical cyclone,” “severe cyclonic storm,” or “tropical cyclone.” The exact terminology depends on the area of origination, as previously mentioned. The term “hurricane” is used to describe those storms that begin in the North Atlantic Ocean, the Northeast Pacific Ocean east of the dateline, or the South Pacific Ocean east of 160 degrees east longitude.

Meteorologists still don’t completely understand how tropical storms are formed. There are, however, six generally accepted factors that lead to tropical storms:

1. Water temperature of at least 79.7 degrees Fahrenheit down to a depth of 160 feet.
2. Rapid cooling with height, which allows for condensation and the release of heat.
3. High humidity is the third factor, which causes instability in the atmosphere and conditions conducive to meteorological disturbance.
4. The fourth factor is a low amount of wind shear. High amounts of shear can disrupt the circulation of a tropical storm.
5. An area of origination within five to twenty degrees of latitude from the equator. The movement of air in this area creates an effect that feeds the circulation of the storm.
6. A pre-existing system of weather disturbance.

While similar in structure to a tornado, hurricanes are much larger, often ranging from three to five hundred miles across. The anatomy of a hurricane is comprised of an “eye,” an “eyewall,” and an “outflow.” The eye is typically fifteen to twenty miles in diameter, but can range from only two miles to as much as two hundred and thirty. The eye is characterized by an area of sinking air. The majority of atmospheric turbulence takes place in the outer layers of the hurricane, so conditions in the eye

## **THE LIFE CYCLE OF A HURRICANE (CONTINUED)**

can be deceptively clear and calm. The eyewall is a circle of strong storms that surrounds the eye. In contrast to the eye, this portion can exhibit the fastest wind speeds and the heaviest precipitation. The eyewall is the part of the storm that causes the greatest amount of coastal damage. At the top of the hurricane system is the outflow, the area where air circulates outward. The activity at the top of the hurricane determines whether the storm will strengthen or weaken. If air flowing out exceeds the intake of air at the bottom, air pressure will decrease and winds will increase.

### **MOVEMENT**

Hurricanes move along large-scale wind streams on a path referred to as the “track.” High and low pressure systems and warm and cold fronts can affect this path. Generally, tropical cyclones in the North Atlantic and Northeast Pacific move in a westerly direction with the trade winds.

### **END**

Since hurricanes are fed by the moisture of warm bodies of water, they dissipate quickly when moving over land.



**HURRICANE KATRINA EYEWALL**  
Source: NOAA



**WILDFIRES**

Source: LTER Media Gallery, Photo by Laona DeWilde

## WILDFIRES

A “wildfire” is any unplanned fire burning in grass, shrubs or a forest.

### TYPES

Most wildfires can be categorized into four main groups: ground fires, surface fires, ladder fires, and aerial fires. Ground fires feed on underground vegetation including roots and organic matter. These fires are some of the longest lasting, and may smolder for days to months. Surface or “crawling” fires feed on low-level vegetation including leaves, grass and debris. Ladder fires consume the material between low-level vegetation and tree canopies, including small trees, vines and logs. Aerial fires may also be referred to as “canopy” or “crown” fires. They feed on plant material at the highest levels, including tall trees, moss, and vines.

**“MOST WILDFIRES CAN BE CATEGORIZED INTO FOUR MAIN GROUPS: GROUND FIRES, SURFACE FIRES, LADDER FIRES, AND AERIAL FIRES.”**

### MEASUREMENT AND CLASSIFICATION

Wildfires are most often measured in two ways: “Forward Rate of Spread,” or “FROS,” and number of acres burned. The forward rate of spread is the speed at which the fire moves horizontally, and can reach up to 6.7 miles per hour in a forest and 14 miles per hour in grasslands. Acres burned can be measured by observation and surveying both on the ground and from the air.

### OCCURRENCE AND PREDICTION

#### Where

Wildfires can occur anywhere in the world except for Antarctica. They are most likely to occur in regions with climates varying between moist and temperate (to allow the growth of vegetation) and dry and warm (to create conditions conducive to fire). These regions can be found in part of Australia and South Africa and in the forests and grasslands of Europe and North America.

#### When

Once you begin to understand the three factors required for a wildfire to occur, it is easier to predict when they will most likely occur. Wildfires in North America typically begin in the summer, fall, and winter, when there is little precipitation and fuel is dry and plentiful. Fires tend to occur in the afternoon, during the warmest period of the day.

**“WILDFIRES ARE MOST OFTEN MEASURED IN TWO WAYS: “FORWARD RATE OF SPREAD,” OR “FROS,” AND NUMBER OF ACRES BURNED.”**

While ninety percent of wildfires are caused unintentionally or intentionally by humans, overall wildfire activity in the United States has increased in recent years as a result of several factors. For one, outdated fire suppression policies have resulted in the accumulation of highly susceptible fuel materials in wild areas of the country. In addition, changing weather patterns and an increase in hot, dry weather have resulted in more favorable conditions for wildfire. Finally, increased residential development has encroached on wild areas, bringing potential human-related fire incidents closer to large areas of combustible fuel.

**DAMAGE**

Wildfires cause millions of dollars of damage in the United States alone every year by burning an average of five million acres and leaving behind devastating effects to vegetation, topography, and the atmosphere. One particularly dangerous effect of wildfires is the destruction of vegetation such that the organic material in the soil becomes weakened to the point that water can not penetrate the soil. When this happens on a slope, dangerous erosion can occur, and there is the potential for future landslides or flash flooding.

Another consequence of wildfires is air pollution and the release of greenhouse gases. This is especially concerning in areas of development, where hazardous materials may be present.

Heat is another obvious product of wildfires, and can produce significant damage (even without flames) by melting or scorching natural materials or structures. The majority of fire damage in the United States occurs in unpopulated areas, but urban growth is constantly bringing development to previously forested areas, increasing the risk for property damage and human or animal injury.

The effects of a wildfire are not always negative. Some ecosystems actually depend on fires to remove accumulated vegetation. When the thick underbrush of a forest is burned, larger fires can be prevented. Fire can also help reduce the spread of disease and promote biodiversity.

**“THERE ARE THREE FACTORS THAT DETERMINE THE DIRECTION AND SPEED OF A WILDFIRE’S MOVEMENT: FUEL, WEATHER AND TOPOGRAPHY.”**

## **THE LIFE CYCLE OF A WILDFIRE**

### **BEGINNING**

Most wildfires (about nine out of ten) are caused by humans. The most common causes are arson, discarded cigarettes, unsafe use of fireworks, and irresponsible or abandoned campfires or debris fires. Some wildfires may be accidentally caused by a spark from a vehicle or piece of equipment, but most are caused by human carelessness. The remainder of wildfires occur naturally as a result of spontaneous ignition by heat from the sun, lightning strikes, volcanic eruptions, coal seam fires or sparks between rocks.

What each of these causes has in common are three components required for ignition and combustion to occur: fuel (to burn), air (to supply oxygen), and heat (to raise temperature to the point of ignition).

### **MOVEMENT**

There are three factors that determine the direction and speed of a wildfire’s movement: fuel, weather and topography. A wildfire can move at speeds up to fourteen miles per hour, depending on these factors.

#### **Fuel**

The fuel consumed in a fire can include grass, shrubs, trees, and structures. The type, size, arrangement, dryness and amount of fuel affects the way a wildfire spreads: the more fuel, the faster the fire can move. The amount of fuel surrounding the fire is referred to as the “fuel load” and is measured by tons per acre.

#### **Weather**

Weather is another important factor in the spread of wildfires, and is measured in terms of temperature, moisture and wind. The higher the temperature, the more likely that fuel warmed by the sun will ignite, and the faster that fuel will burn. The less moisture in the atmosphere, the more easily the fire will burn. It is an obvious fact that drought leads to favorable conditions for wildfires. Humidity and precipitation can weaken fires, and fuel with high moisture content is more difficult to burn.

## THE LIFE CYCLE OF A WILDFIRE (CONTINUED)

The more wind there is, the more easily the fire will spread, because wind supplies the fire with fresh oxygen, dries the fuel, and pushes the fire across the ground. Wind is the most unpredictable factor in the movement of a fire. It can speed up, slow down, and change direction with little warning, taking fire with it.

### Topography

The slope of the land also has an effect on the spread of a wildfire. Because heat rises and winds typically blow uphill, fires travel uphill much faster than downhill. The steeper the slope, the faster the fire can move. Rising heat and moving wind dries and preheats fuel at higher elevations, making it easier to ignite. Fires can sometimes extinguish themselves by running out of fuel at the top of a hill, because it's difficult for them to come back down.

The movement of a wildfire can be described using several different terms. The “front” of a wildfire is where unburned fuel meets active fire in an area of continuously sustained flames. A “flanking” fire is one that advances tangential to the main front. A “backing” fire burns in the opposite direction of the main front. “Jumping” or “spotting” is caused by wind that carries burning materials through the air, igniting new fires. “Flashover” or “torching” is the term used to describe the ignition of the tree canopy from the burning underbrush below.

Wind is not just a factor in the movement of a fire, but a product of the fire itself. Large fires can create rotating winds called “fire whirls,” in which vortexes of fire lift and move burning debris much like a tornado. These vortices are often vertical, but can also be horizontal, causing the fire to jump forward. Some fires have been known to ignite smaller fires miles away by carrying burning embers on the wind.



**FIRE WHIRL**

<http://babycreativeblog.files.wordpress.com/2009/10/tornado-31.jpg>

**THE LIFE CYCLE OF A WILDFIRE (CONTINUED)**

**END**

Wildfires last as long as fuel, air and heat are sustained. Some fires last only minutes, while others can rage on for days, or even weeks.

Wildfires can usually be brought under control by removing one of the three major elements (fuel, air, or heat). Adding moisture in the form of precipitation or extinguishing water can help end a fire.

# EARTHQUAKES



**2008 EARTHQUAKE IN CHINA**

<http://blog.syracuse.com/shellife/2008/05/quake.jpg>

## EARTHQUAKES

An earthquake is defined as the sudden release of energy within the earth's crust, creating seismic waves. Earthquakes are classified by a shaking (and sometimes displacement) of the ground.

### MEASUREMENT AND CLASSIFICATION

Earthquakes are measured using an instrument machine called a seismograph that detects ground vibrations from beneath the ground. Two different scales are used to classify earthquakes: The Richter Scale, which rates the magnitude of an earthquake by the amount of energy released; and the Mercalli Scale, which measures the extent of damage. While Richter scale measurements are made soon after the earthquake, Mercalli Scale measurements are made shortly thereafter, when damage has been surveyed and those who have experienced the earthquake firsthand have been interviewed.

**“TWO DIFFERENT SCALES ARE USED TO CLASSIFY EARTHQUAKES: THE RICHTER SCALE, WHICH RATES THE MAGNITUDE OF AN EARTHQUAKE BY THE AMOUNT OF ENERGY RELEASED, AND THE MERCALLI SCALE, WHICH MEASURES THE EXTENT OF DAMAGE.”**

The Richter Scale uses seismographic data to classify earthquakes within a range from (2 or <3) to (+9). Each unit of increase represents a thirty-fold increase in release of energy and a ten-fold increase in ground movement. The majority of earthquakes measure less than 3 on this scale. These are referred to as “microquakes,” and typically do little damage. Major earthquakes are those that rate above 7 on the Richter Scale. The largest earthquake ever on record rated a 9.5.

### OCCURRENCE AND PREDICTION

Earthquakes are the most unpredictable of the natural disasters. Because their occurrence is not related to weather, they can occur in any month, at any hour, under any conditions. Earthquakes happen all over the world, most frequently along fault lines. More than three million earthquakes occur around the world every year (an average of one every eleven seconds!). Most of these are much too weak to feel, and fortunately the majority of major earthquakes occur in uninhabited locations.

The only way to attempt to predict an earthquake is to gather long-term data and identify areas of frequent seismic activity. Occasionally a loud rumbling of the earth is heard before actual shaking begins, providing a small amount of time for people to seek shelter. Unfortunately, this is not always the case, and a sudden earthquake can produce devastating consequences for those in its path.

## **DAMAGE**

The shaking produced by earthquakes can produce direct effects to structures, roadways and infrastructure. An earthquake also has the potential to create other natural disasters such as avalanches, landslides, and flooding. Offshore earthquakes may displace the sea floor enough to cause a tsunami, which can in turn cause significant coastal damage. Earthquakes are particularly dangerous when they create structural instability that may not be visible, such as foundation cracking and underground damage. Another dangerous effect of an earthquake is the rare phenomena referred to as “liquefaction,” in which violent shaking of the ground can cause sediment and soil to behave like a liquid. When this happens, mudslides and severe structural damage may occur.

Unlike other natural disasters, earthquakes don’t usually harm people directly. Lives are usually lost in building or structural collapses caused by the earthquake. In some severe cases, lives may continue to be lost in the days or weeks following the earthquake, when shelters, food, and water supplies are destroyed.

**“AN EARTHQUAKE ALSO HAS THE POTENTIAL TO CREATE OTHER NATURAL DISASTERS SUCH AS AVALANCHES, LANDSLIDES, AND FLOODING.”**

**“THERE ARE THREE TYPES OF PLATE MOVEMENT, RESULTING IN THREE TYPES OF PLATE BOUNDARIES: DIVERGENT PLATE BOUNDARIES, CONVERGENT PLATE BOUNDARIES AND TRANSFORM BOUNDARIES.”**

## THE LIFE CYCLE OF AN EARTHQUAKE

### BEGINNING

Most earthquakes are caused by activity along a geological fault, but they can also be caused by other geological forces including volcanic eruptions, or landslides. Human activity like mine blasting, building collapse, and nuclear experiments can also cause earthquakes. Rarely, they can even be caused by meteoric impacts.

Comprehending how earthquakes occur requires an understanding of the Theory of Plate Tectonics. This scientific theory, developed in the late 20th century, began with concepts of continental drift and sea floor spreading. The theory states that the earth's outermost layer, is made up of seven sections that are constantly moving in relation to one another. The area where these plates meet is called a plate boundary or a fault.

There are three types of plate movement, resulting in three types of plate boundaries:

1. Divergent plate boundaries occur where plates move apart.
2. Convergent plate boundaries occur where plates move together
3. Transform boundaries occur where they slide against each other.

These different types of movement can produce four different types of faults.

1. A normal fault is a nearly vertical fault plane that occurs at a divergent plate boundary.
2. A reverse fault is a nearly vertical fault plane that occurs at a convergent plate boundary.
3. A thrust fault describes a nearly horizontal fault plane at a convergent plate boundary.
4. A strike-slip fault occurs at a transform boundary where plates move in opposite directions.

Earthquakes can occur anywhere on the face of the earth, but are much more likely to occur along plate boundaries.

## THE LIFE CYCLE OF AN EARTHQUAKE (CONTINUED)

An earthquake happens when pressure builds up along a fault, becomes strong enough to overcome the friction of rocks pushing together, and releases a sudden burst of kinetic energy. Most earthquakes occur along already existing faults, but some can occur along newly forming ones.

### MOVEMENT

Earthquakes themselves do not really move, but seismic activity may transfer from one area of energy release to another. When kinetic energy is released along a fault, the first, intense event is referred to as the “main shock.” This initial event can often increase the potential energy of nearby faults, leading to other earthquakes. These quakes occur in the same region as the main shock and will continue to occur as the lithosphere shifts and adjusts to the movement of the main shock. While the aftershocks are generally less intense than the main shock, they can still be quite intense, and their unpredictability can make them very dangerous.

When a plate shift occurs in the earth’s outer layer, seismic waves are released. Two different types of waves radiate outward from the area of disturbance:

1. Body Waves are those that move through the earth.
2. Surface Waves are slow moving waves that travel over the surface of the earth and cause the majority of damage.

### END

Earthquakes require massive amounts of built-up energy in order to continue. Once all of the energy has been released, and friction once again overcomes the potential energy, the shaking of the earth will stop. Earthquakes can also stop when the transfer and release of energy reaches the end of a fault, and the energy required to extend the fault is overcome by friction. It is difficult to predict when an earthquake will stop. Most large earthquakes only cause strong ground shaking for about ten to thirty seconds, but particularly large quakes can result in aftershocks for months or even years.



**AFTERMATH OF 2010 HAITI EARTHQUAKE**

Source: UN Photo/Logan Abassi United Nations Development Programme

# RESPONSE PHASING



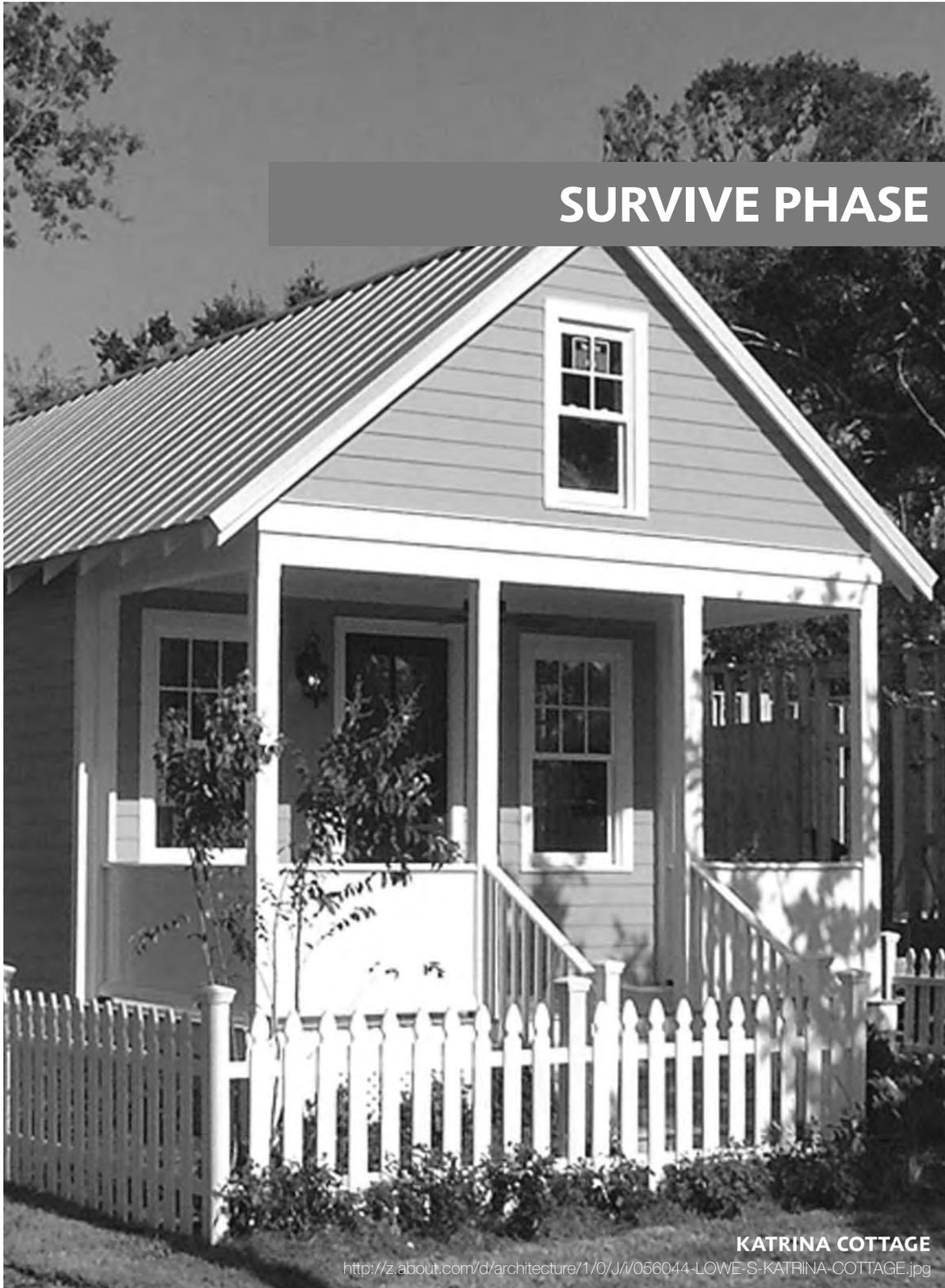
**2010 EARTHQUAKE, HAITI**

<http://www.theoaklandpress.com/articles/2010/01/18/news/doc4b54a3fdd8da6662423761.txt#photo1>

## RESPONSE PHASING OVERVIEW

There are three main phases in the response to any disaster: the period immediately following a disaster during which critical human needs are met, referred to as the Immediate Response, or the “Emergency Phase”; the Interim Response referred to herein as the **“Survive Phase”**; and the Long-term Response, referred to herein as the **“Thrive Phase”**. This document covers only the last two phases.

# SURVIVE PHASE



**KATRINA COTTAGE**

<http://z.about.com/d/architecture/1/0/J/i/056044-LOWE-S-KATRINA-COTTAGE.jpg>

## SURVIVE PHASE OVERVIEW

During the Survive Phase, the urgency of action associated with the Emergency Phase is continued in order to establish temporary measures of general welfare after the first responders have completed their work. Swift temporary action continues to be taken to maintain safety and meet essential basic needs. This remains a crisis management environment in which decisions are more heavily weighted toward a subsistence mentality while concerns of quality of life, though given some consideration, are still less pressing. Even during the Survive Phase, consideration starts being given to community and social concerns, as the perceived security of citizens will be enhanced by the strength of the community.

**“ACTION TAKEN DURING THE SURVIVE PHASE AND INTENDED TO BE TEMPORARY MAY SLOWLY BECOME UNINTENTIONALLY PERMANENT. THIS IS PARTICULARLY TRUE WITH RESPECT TO HOUSING.”**

## PLANNING STRATEGIES

### CREATING COMMUNITY IN TEMPORARY HOUSING

As was illustrated after Hurricane Katrina, even action taken during the Survive Phase and intended to be temporary may slowly become unintentionally permanent. This is particularly true with respect to housing. After Katrina, some residents of New Orleans were still living in FEMA trailers at the time this publication was written, some five years after the disaster. It is because of the indefinite time span of “temporary” housing that it is necessary to think of disaster housing in terms of creating a community, not just shelter.

Re-instilling a sense of community is important during the Survive Phase. This can be enhanced even when utilizing structures such as FEMA trailers. While the primary concern is providing shelter following a disaster, it is not the only concern. The social and psychological benefits of a sense of community outweigh any presumed efficiency or economy of simply packing as many temporary shelters together as possible.

One of the most important things that can be done is to create a civic space in a central location, ideally no more than a five minute walk from all homes. Temporary housing should be arranged around the civic space, even if utilizing a portion of the available space as a central civic space means having fewer units located together. This central space needs to be large enough for many people to gather and for children to play. If possible, a civic structure, such as a pavilion, should be built. Storm cleanup efforts can provide furniture or materials construction. If the area where temporary housing is established is very large, it may be necessary to provide smaller open spaces in addition to the main central open space.

### ALTERNATIVES TO FEMA TRAILERS

Another lesson learned from Hurricane Katrina is that there are alternatives to the ubiquitous white FEMA travel trailer that cover the American landscape after a disaster. An excellent alternative has been designed by New Urbanist architects, using contextually sensitive design and traditional architectural syntax to create temporary housing that is as modular, portable, inexpensive and easy to set up as FEMA trailers – the “Katrina Cottage”. These efforts were so successful that they simultaneously created houses of such aesthetic and

construction quality that they actually could be lived in permanently by choice. The Katrina Cottage was so well received (by all except FEMA) that Lowe's, the national chain of home improvement stores, now offers several models of these cottages and sells them as kits around the country. These cottages have been built as small vacation cottages, permanent residences, affordable houses and for other applications. An additional benefit of Katrina Cottages is that they are suitable for being located on the lot where the resident's original home was located. They can then be left on the site to become a new permanent home or an element of the new home.

Another application of the concepts and philosophies that inspired the Katrina Cottage has evolved. Following the earthquake in Haiti in January of 2010, the design firm Duany Plater-Zyberk & Company ("DPZ"), developed a panelized structure that not only would serve as a replacement for a demolished home but also would have a better chance to withstand future earthquakes. In addition to the safety features, these units, while not necessarily designed with a focus on architectural styles of the region, incorporate culturally based living preferences in Haiti. To ensure that these structures would be culturally sensitive, the DPZ team worked with a sociologist who was an expert on Haitian customs and traditions. This multidisciplinary approach yielded several insights that informed the final design of the new structures. At the time of this publication, the first of the units were under construction and scheduled to be delivered to Haiti.



# CREATING A PLANNING & REBUILDING RESPONSE TEAM



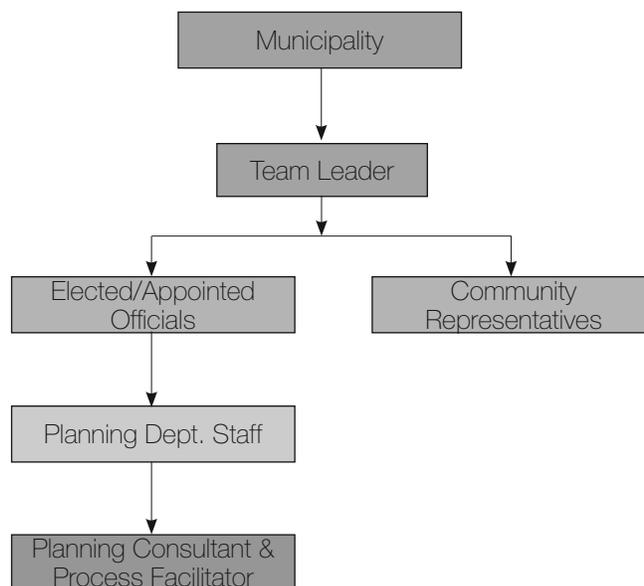
## CREATING A PLANNING & REBUILDING RESPONSE TEAM

Much in the same way FEMA or other aid organizations send in response teams, the planning and rebuilding process requires a response team to take the lead in the process, carry the momentum and see the rebuilding through to fruition. This team should consist of local leaders who will become the champions of the process. In this context, leadership is not intended to mean only elected officials, although it is anticipated that there will be some elected officials participating as members of this team. However, essential to the process are those strong citizens who step forward as leaders and lead the community forward in ways that the elected officials may not be able to.

### MEMBERSHIP QUALIFICATIONS

The prerequisites for membership on this team should be based on a combination of qualifications and experience but the most important elements must be enthusiasm and passion for the task at hand.

### TYPICAL TEAM COMPOSITION FLOWCHART



## TEAM ROLES & RESPONSIBILITIES

### TEAM LEADER

The role of the Team Leader is the most important of all positions. This person will have primary responsibility for organizing and overseeing all aspects of the Response Team's work and will interface with local interests, outside agencies, volunteers and consultants.

### ELECTED AND APPOINTED OFFICIALS

The elected and appointed officials on the Response Team would provide the team guidance and insight from a governmental perspective. In addition, such officials would serve as a liaison between the planning commission, the city council and the Team.

### COMMUNITY INVOLVEMENT

Citizens on the Response Team would share their hopes, dreams and aspirations for the future of the city and assist the Team and planning consultant in crafting the vision for that future. In addition, many disaster response efforts have been led by citizens with a passion for the work and a willingness to be a driving force for the rebuilding effort.

### IN-HOUSE STAFF EXPERTISE

The member of the planning staff who serves on the Response Team should provide professional guidance to the Team and planning consultant based on such member's local experience and insight. In addition, the planning staff member would provide technical support to the Team and the planning consultant.

### PLANNING CONSULTANT

The planning consultant would lead the creative aspects of the design and planning process for the rebuilding effort. This would include conducting a planning charrette.

## TEAM COMPOSITION

### TEAM LEADER

There should be a Response Team leader, preferably a high ranking city official such as the mayor, city manager or possibly a person specifically hired to take on this important role. It is key that the team leader be on salary with the municipality, affording him/her the ability to dedicate all of their time and resources to the effort. This person must be innovative, resourceful and think outside the box since the “box” has been obliterated by the disaster.

There is no room in the rebuilding process for political gamesmanship, so the team leader must be self confident and politically independent, willing to make difficult and sometimes politically unpopular decisions. The rebuilding process is dynamic and as a result, the team leader must be granted authority to make decisions at a moment’s notice without excessive “red tape” or review processes. This will allow him/her the flexibility to seize opportunities that unexpectedly present themselves.

The role of the Team Leader will be difficult and require much of the person in this position, but the sense of fulfillment will be immeasurable. They should be fully supported at all levels in the municipality and the magnitude of their responsibility acknowledged and respected.

### ELECTED AND APPOINTED OFFICIALS

The Response Team must include at least one member from both the City Council or similar elected body and the Planning Commission or similar appointed body responsible for making planning and zoning decisions. This will ensure that there is one member from each body that has an intimate understanding of the plans and process and alleviate some of the anxiety of their fellow council and commission members as to the work of the Response Team and the details of the plans.

### COMMUNITY INVOLVEMENT

The remainder of the Response Team should be created through a community-wide open invitation process. It is imperative that an understanding of the long-term nature of the commitment and expectations for team members is clearly communicated to applicants.

## TEAM COMPOSITION (CONTINUED)

### IN-HOUSE STAFF EXPERTISE

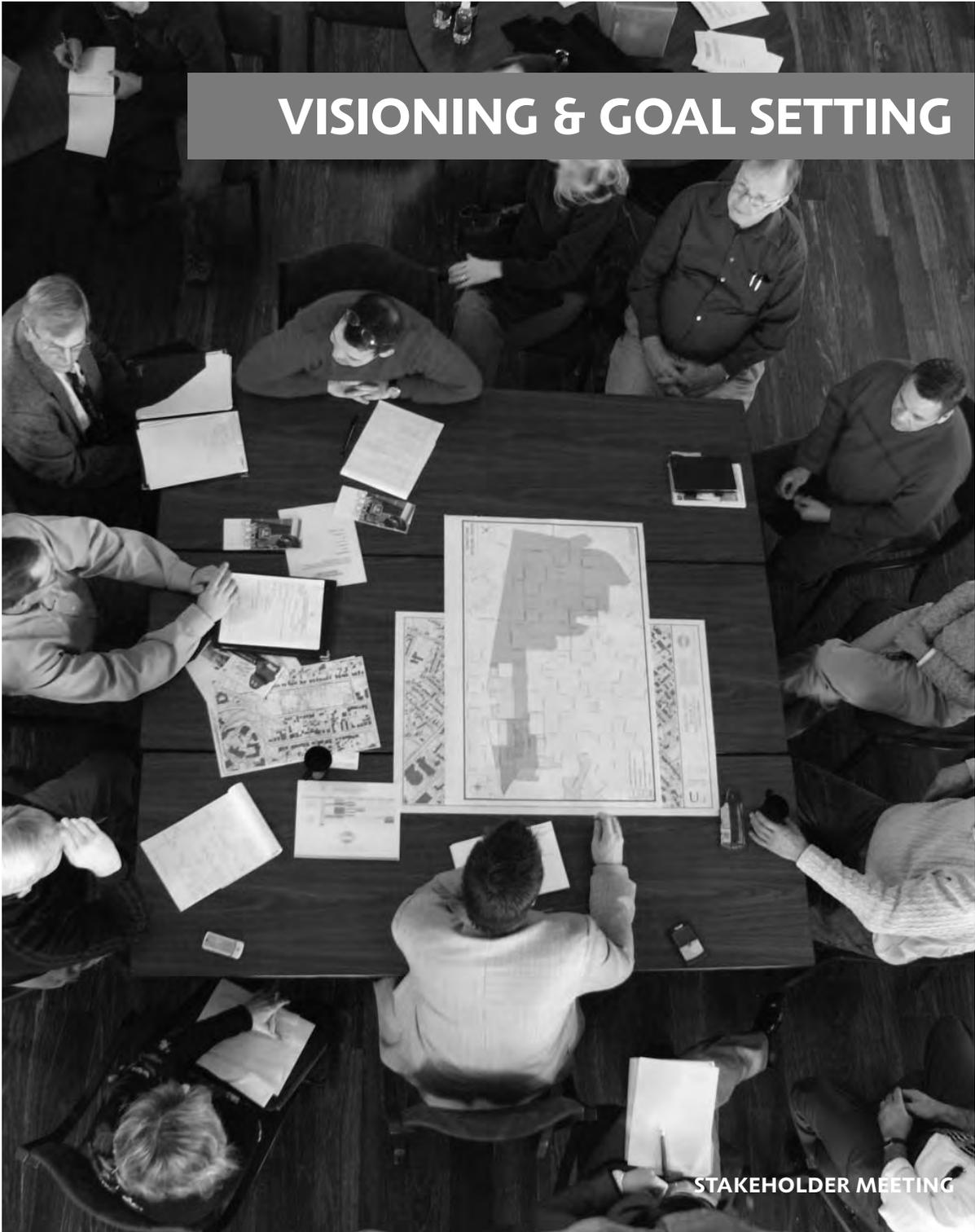
Another key component in the process, in municipalities that have one, is the local planning department staff. The planning staff has the most in-depth understanding of the local process and development environment. Their experience and knowledge can be an invaluable resource. However, because of their familiarity with the way things were before the disaster, they may have a difficult time operating under a new paradigm and thinking outside of the box. If the city does not have a Planning Director, it is critical that one be retained. In order to assist in the process of using the catalyst of a disaster to redefine the built environment, the planning staff and the Planning Director will need to be well versed in the concepts, ideas and principles contained herein and adopt them as their own.

### PLANNING CONSULTANT

To move forward with the planning and rebuilding of a community following a disaster, it will be necessary to have a detailed and specific master plan and comprehensive plan documents. These documents should be imbedded with the principles, concepts and ideas in this document. Many municipalities will have master plans and a comprehensive plan already adopted at the time of the disaster. If this is the case it will be necessary to update them based on the new conditions found after the disaster and determine if the strategies in them are still relevant or if new ideas need to be added. As many municipalities operate outside of disaster conditions, it will likely be necessary to have a planning consultant work with or as a part of the Response Team to create the planning and rebuilding master plan and strategic documents. This work should be done with close cooperation of the local planning staff.

## TEAM AUTHORITY

The Response Team's involvement and authority should be granted so that it diminishes as time passes following the disaster. Immediately following the disaster, the authority of the Team should be expansive. As the rebuilding effort begins to transition into implementing the plans of the Response Team, authority would be reduced and shared more with elected and appointed officials. Deference should be given to the Team when there is not clear consensus among the members of the Planning Commission or Council. Because the Team will have become so intimately involved and informed during the process, their experience and insight should be treated as valued input. In addition, since the process will have been community driven from the beginning, including the use of a public charrette and integration of citizens within the Team, the work of the Team will be closely aligned with the desires of the community. Finally, at some predetermined point following the disaster the Response Team will have completed its work and is no longer necessary in an official capacity; however the Team Leader will need to continue to be fully involved in decisions and efforts based on the Team's work.



# VISIONING & GOAL SETTING

STAKEHOLDER MEETING

## VISIONING & GOAL SETTING

### THE CHARRETTE PROCESS

The planning consultant should utilize three primary phases of work leading to the creation of the post-disaster Master Plan. These phases should all be organized around the central concept of a charrette.

The first phase, the Pre-Charrette Phase, would consist primarily of research, data collection and organization, preliminary stakeholder meetings, marketing and charrette preparation. This phase typically would take 6-8 weeks, depending on the specific project scope and requirements.

The second phase of the work would be the Charrette Phase. This phase would involve an intense, participative process which would include a five-to-ten day public planning and design effort, in which all interested members of the community would work directly with a multidisciplinary design team, including town planners, urban designers, architects, landscape architects, illustrators and coding experts, to define a collective vision for the city. This vision would be incorporated into the Master Plan, development code and other related supporting documents. Much of the actual master planning, design, mapping and graphic production would take place during the Charrette Phase.

The charrette would be specifically designed to involve all community members interested in or concerned about rebuilding the community. Several meetings would be held each day throughout the week, and a number of pin-ups would be presented at key points in the planning and design process. During these pin-ups, the charrette team would receive feedback from participants about the best elements of each of several plans presented. The planning consultant then would incorporate this direct public feedback into new versions of the plan, helping to distill and refine the common vision.

Due to the transparency of the charrette process and the direct nature of citizen participation, the Master Plan will represent a vision that the entire community can embrace.

An important advantage to the charrette process is its extraordinary efficiency. As noted, during this compressed event, many of the Master Plan and supporting documents are produced. Unlike Master Plans produced behind closed doors and presented to the public after all decisions have been made, the Master Plan created in the charrette process will have a much higher probability of success, acceptance and approval.

The final phase, or the Post-Charrette Phase, includes the production of the final Master Plan and Charrette Report. Depending on the scope of the project and the period of review, this phase may last 2-3 months.

#### CHARRETTE

A charrette is an intense, participative process usually lasting five to ten days where all members of a community work directly with a multidisciplinary design team, including town planners, urban designers, architects, landscape architects, economic analysts, illustrators and coding experts to define a collective vision for a region.

**THE FOLLOWING TASK LIST SETS OUT THE STEPS OF EACH TASK OF THE PROCESS THAT WOULD BE USED BY THE PLANNING CONSULTANT:**

**TASK 1 – DEVELOP COMMUNITY OUTREACH PLAN**

Few issues are as crucial to a project as initiating and maintaining meaningful public involvement throughout the life of the project. The vision must be comprehensive, inspiring, and resonate with the public at large. While the solutions may be complex, the basic conceptual format of the vision and its importance must be easy to understand. Wide-spread public participation in developing the vision is critical to the long-term success of the work. The planning consultant must have strong consensus building skills and must listen, educate, enlighten and inspire the public through the process.

The planning consultant should prepare a Community Outreach Plan to assist the city in reaching out to stakeholders. Methods will need to be employed to integrate various target audiences into the public outreach effort to ensure that all voices are heard.

**TYPICAL STAKEHOLDER LIST:**

- Jurisdiction President;
- Jurisdiction Manager;
- Jurisdiction Trustees;
- Jurisdiction Building & Water Department Staff;
- Planning and Zoning Commission Members;
- Elected officials;
- Fire & Police Department;
- Department of Commerce & Economic Opportunity;
- Community and Neighborhood Leaders;
- Business Leaders;
- Chamber of Commerce;
- Key Institutional Leaders;
- Historic Preservation Representatives;
- Department of Transportation,
- Developers;
- General Public; and
- Local Authorities.

The Charrette will be an essential element in receiving input from the community, key stakeholder groups and the general public.

Stakeholders will need to be involved throughout the entire planning process. These stakeholders will be defined as individuals, organizations, or groups important to data collection efforts, consensus building, or to the adoption and implementation of the resulting Master Plan and related documents.

The planning consultant would meet with the planning staff and local officials as part of the public meetings associated with the charrette, as well as during the Adoption Process.

Using these audiences as the starting point, the planning consultant would prepare a detailed Community Outreach Plan, outlining the elements and timing of meetings and public collaboration. The plan should include the following:

**TYPICAL COMMUNITY OUTREACH PLAN:**

- Final establishment of audiences (outlined above) and timing of meetings associated with public outreach and collaboration;
- Methods and materials anticipated for use throughout the public outreach effort and for each audience such as media outreach, surveys and questionnaires, a project branding strategy, digital marketing material, and interactions with target groups;
- Method for collecting and summarizing public input;
- Strategy for use of print and broadcast media for public meeting announcement, information provision and collection of input;

## **TASK 2 – CHARRETTE**

This task will involve holding a multi-day planning and design charrette to develop a rebuilding Master Plan, with supporting diagrams and renderings to clearly communicate rebuilding strategies, using Smart Growth and sustainable design principles.

The charrette would be an intensive community design workshop, usually lasting five to ten days. The planning consultant would organize a multidisciplinary charrette team to create the Master Plan, all supporting documents and a form-based land use code and standards for the city.

The charrette would be held at a site in the city where the planning consultant, the Response Team and public officials will assemble for several days. The charrette team would set up a full working office and studio at the site and work in conjunction with public presentations and meetings.

Input received from these meetings and public presentations would then be incorporated into new versions of the Master Plan.

### **TASK 2.1 – OPENING PRESENTATION**

On the first evening of the charrette, the planning consultant would deliver an introductory lecture on planning principles and Smart Growth.

### **TASK 2.2 – HANDS-ON WORKSHOP**

The charrette team would facilitate a hands-on design workshop where the public is invited to roll up their sleeves, draw and brainstorm directly with the charrette team around tables, working over base maps to identify key areas where redevelopment should be focused.

### **TASK 2.3 – SYNOPTIC SURVEYS & REGIONAL TOUR**

On the first day of the charrette, the planning consultant will conduct a reconnaissance site tour of the city. This tour will provide important documentation of existing conditions during which the planning consultant will photograph, measure and collect data from the study area, looking at both good and bad examples of settlement and development. In addition, the team will focus on documenting the unique vernacular architectural characteristics of the region. This architectural image library will later form the basis of the Form-Based Development Standards.



**STAKEHOLDER MEETING**

The charrette team will analyze the best examples of development, incorporating the data into detailed Synoptic Surveys arranged by context using the rural to urban Transect.

Parallel with the Synoptic Survey, the planning consultant will review the city's existing land use ordinances.

#### **TASK 2.4 – STAKEHOLDER MEETINGS**

During the charrette, many formal and informal meetings will be held with various approving agencies and interest groups.

#### **TASK 2.5 – DEVELOP ILLUSTRATIVE MASTER PLAN**

Based on the input from the public received at the hands-on Workshop and the stakeholder meetings, the planning consultant will develop Master Plan for the city. The Master Plan will clearly depict recommended redevelopment scenarios and building configurations, parks and plazas, street connections, and public facilities.

All scenarios will be designed to improve on the safety and quality of the pedestrian environment, provide uses that serve as pedestrian generators, and incorporate design solutions for an enhanced, attractive and safe pedestrian environment.

Finally, the Master Plan should incorporate the latest in sustainable and “Green” concepts with such concepts as Light Imprint New Urbanism and LEED standards for Neighborhood Development.

#### **TASK 2.7 – INTERMEDIATE PIN-UPS & CRITIQUE**

A number of pin-ups would take place at key points in the planning and design process. During these pin-ups, the charrette team would get feedback from participants about the best elements of each of the plans presented.

#### **TASK 2.8 – PREPARE ILLUSTRATIONS**

The planning consultant should create a series of street-level and bird's-eye renderings to illustrate how the Master Plan will look and feel from the view of a pedestrian. “Before and after” illustrations will enable the public to better understand the plan and provide feedback on the vision.



REFINEMENT OF PLANS AND ILLUSTRATIONS

**TASK 2.9 – PLAN REFINEMENT**

The remainder of the charrette consists of daily design, incorporating information and ideas gathered from the public during the intermediate pin-up and from key stakeholders during meetings. Based on feedback, there should be several iterations of plans created throughout the charrette.

**TASK 2.10 CLOSING PRESENTATION**

A final presentation would take place on the last day of the charrette. All of the work produced during the charrette would be presented and explained at that time.

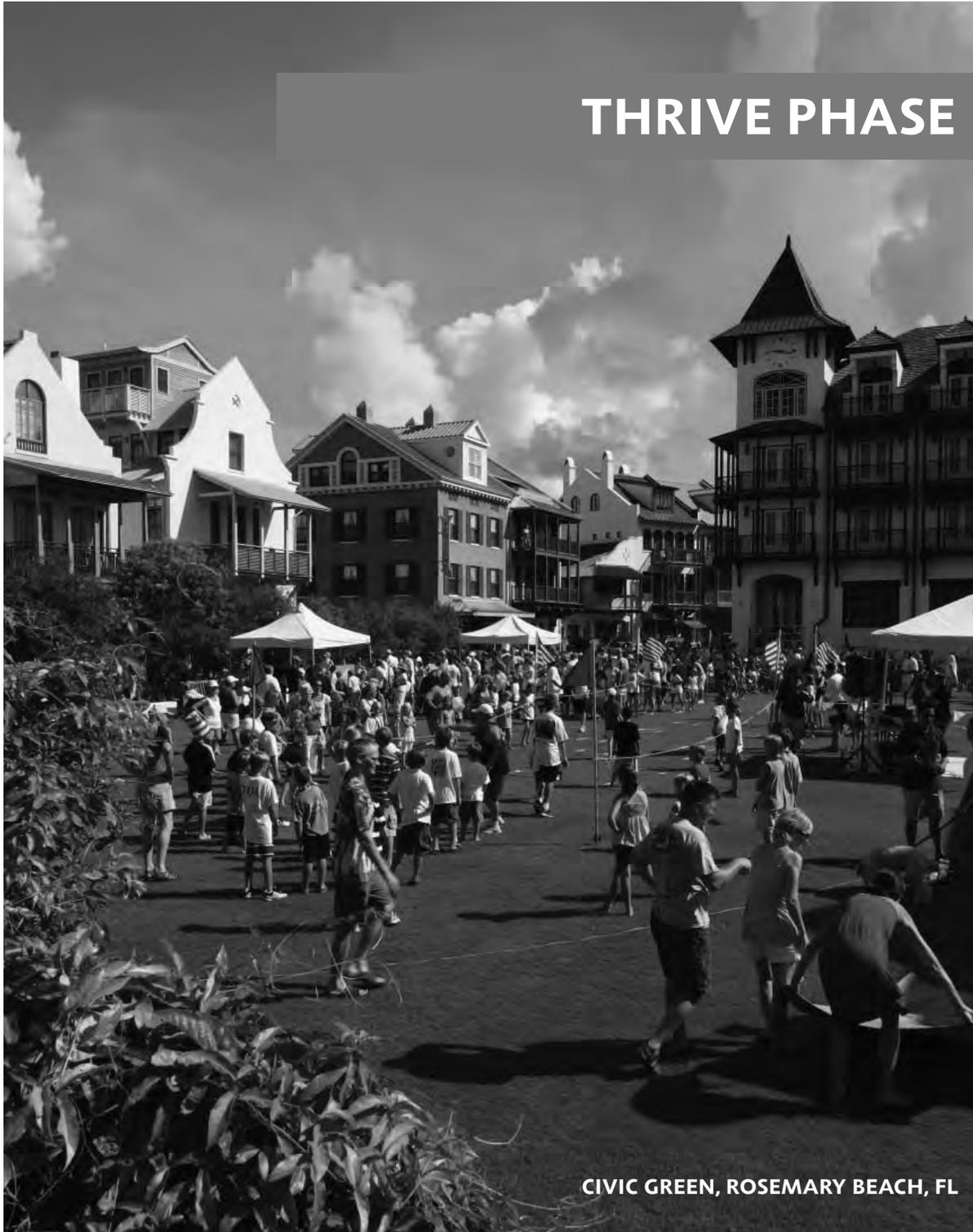
**TASK 2.11 – POST-CHARRETTE MEETING**

The planning consultant and the Response Team should have a post charrette meeting to answer any questions following the charrette, review the schedule for the completion of the Master Plan and associated documents, and to explain what items will be sent following the charrette and how each part relates to others (i.e. the plan and documents produced at the charrette, renderings and other products).



**LOCAL TEAM & CONSULTANT MEETING**

# THRIVE PHASE



CIVIC GREEN, ROSEMARY BEACH, FL

## THRIVE PHASE OVERVIEW

In contrast to the Survive Phase, the long-term “Thrive Phase” is geared more toward quality of life because less concern has to be given to basic subsistence needs. At this point, healing can begin through the therapeutic process of accomplishing goals. Focus can begin to shift toward creating a better place than may have existed before the disaster. Long-term thinking is introduced and hope for the future becomes possible.

**“THE CENTRAL FOCUS OF THE TOOLKIT IS ON THE LONGER TERM RESPONSE, THE THRIVE PHASE.”**

The central focus of the Toolkit is on the longer-term response of the Thrive Phase. It is during this phase that important rebuilding efforts must be informed by sound planning and design decisions, intentionally directed toward either rebuilding a previously excellent built environment or creating an even better built environment than existed before the disaster. It is critical that concepts of sustainability, self sufficiency, walkability, community, place-making, character, and rebuilding the economy be integrated into those decisions.



# SUSTAINABILITY STRATEGY

STORMWATER CISTERN AND PLANTER AS CIVIC ART, SEATTLE, WA

## GENERAL

### DISASTER CLEAN-UP & RECYCLING

**“A RECYCLING PROGRAM SHOULD BE SET UP TO ENSURE THAT THE DEBRIS CREATED BY THE DEMOLITION OF BUILDINGS AND LANDSCAPES DOES NOT GO TO WASTE.”**

Beginning the practice of creating a sustainable future can start almost immediately following a disaster. In so far as it is practical, a recycling program should be set up to ensure that trash and debris created by the demolition of buildings and landscapes does not go to waste. The act of recycling the homes and business that have been destroyed may lessen owners’ feeling of loss because they know that the structures they loved will not be completely wasted. Special attention should be given to reusing materials from historic structures. It is possible to set up an on-site lumber mill to transform fallen trees into usable lumber for park benches and small scale structures such as pavilions or playground equipment.



RECYCLING, COMPOST AND WASTE STATION, PORTLAND, OR

## APPROPRIATE TECHNOLOGY

When seeking innovative solutions to problems, it is beneficial to look at how problems are solved in seemingly unrelated circumstances. These connections, which are sometimes overlooked because of our tendency to focus on the specifics of our personal situations, are often the most insightful.

In developing countries, the problem at hand may not be a catastrophic moment of disaster. Instead, there is often a daily struggle, the long-term effect of which is devastation in orders of magnitude greater than that sustained in any natural disaster such as a hurricane, earthquake, flood, and tornado or forest fire. Most of this devastation is caused by extreme poverty leading to a lack of resources to construct modern infrastructure to sustain healthy living conditions. For these circumstances, strategies, systems and low-tech technologies have been developed to improve the living conditions in those communities. This concept of low-tech simple engineering solutions and social programs designed to utilize local resources while keeping the context of the community for which they are being implemented in mind is known as Appropriate Technology. Appropriate Technology requires less financial investment and relies more heavily on the users of the systems to build, operate and maintain them.

Examples of appropriate technology range from simple solutions such as rainwater harvesting for irrigation to more advanced systems like the “roundabout playpump” from Roundabout Water Solutions, which was developed and used in southern Africa to harness the energy of children at play on a merry-go-round to pump water from a well. Other examples include treatment ponds and constructed wetlands in which the wetland plants help to purify sewage and greywater in a process called ecological sanitation.



# WATER

## REDUCTION OF STORMWATER INFRASTRUCTURE

When thinking about the impacts of a disaster, some of the greatest challenges a community faces relate to its dependence on complicated infrastructure. While this infrastructure makes daily life convenient, in many ways it makes a community more susceptible to additional loss of life following the disaster due to lack of safe water and can cause delays in getting life back to normal. Even outside of the context of a disaster, conventional infrastructure used to maintain the suburban lifestyle is often oversized - designed to handle the worst possible scenario. This is costly to install and maintain, and has a negative impact on the environment. It is for these reasons that a sustainability strategy should begin with finding ways to reduce dependence on complicated infrastructure systems to meet our daily needs.

There are more environmentally sensitive methods that can be employed that also are less expensive. These methods are not new or revolutionary. A key element in better addressing stormwater management is the reduction of impervious surfaces. Automobile dominated sprawl development has made stormwater management more difficult and expensive, as it has resulted in increased impervious surfaces in the form of wider roads and large parking lots.



STORMWATER MANAGEMENT SYSTEM, MONTGOMERY, AL

In the past few years, however, there has been a push to deal with stormwater in a more sustainable way in order to reduce the infrastructure needs and protect ground water. One of the first attempts was known as Low Impact Development (LID). While LID was based on sound ecological principles, its solutions were based on conventional suburban land use and planning concepts. The result was more auto-oriented sprawl that utilized natural infiltration. However it did not address the numerous other environmental ills created by the single-use, car-dependent development form it was predicated upon.

Building on the groundwork laid by Low Impact Development, a new approach called Light Imprint has been developed by Duany Plater-Zyberk & Company. Light Imprint utilizes New Urbanism as its design philosophy and according to the Light Imprint Handbook by Tom Low, incorporates natural drainage, modern engineering infrastructure and innovative infiltration practices. Many of the elements of Light Imprint are time-tested and provide a comprehensive collection of methodologies that have been used for generations to deal with stormwater runoff. Each tool is organized according to its appropriateness across a range of rural to urban contexts. Light Imprint reduces the need for expensive stormwater infrastructure and provides more sustainable solutions than conventional engineering approaches.



## MAINTAIN EXISTING HYDROLOGICAL PATTERNS

All sustainable stormwater solutions should begin with the simplest and least technologically based steps. The easiest technique that can be implemented with the least expense is preserving the existing hydrological patterns of drainage and percolation, allowing the land to handle the water naturally without much, if any, interference from human intervention. Much of successful sustainable stormwater management is related to staying out of nature's way and avoiding creating the problems we struggle to remediate. By following natural hydrological patterns in the landscape and using them as the framework that all other techniques are built around, sustainable stormwater practices can alleviate much of the need for expensive conventional engineering approaches and will inform the planning and design of communities by becomes a design element.



PRESERVED CREEK BED AND TREE ROW, FRANKLIN, TN

## NATURAL INFILTRATION

An essential element of sustainable stormwater management is natural infiltration. There are a number of solutions to collect water during storm events and enable it to percolate naturally into the ground, recharging the aquifer in the process. The determinative factor as to whether infiltration can occur is the permeability of the surface onto or over which stormwater falls or flows.

## PAVING

Paved surfaces including roads, parking lots, sidewalks and other hardscaped areas typically utilize asphalt, concrete or tar surfaces which are all impervious. As a result of the paving material chosen and their lack of permeability, these surfaces tend to exacerbate stormwater runoff related issues. There are many materials that are more pervious and are time-tested including more recent innovations in paving technologies such as pervious asphalt and concrete. These have been developed to allow water to infiltrate large- and small-scale paved surfaces. These materials should be utilized whenever feasible.



## RAIN GARDENS & BIORETENTION SWALES

A natural infiltration solution that incorporates short term storage of stormwater in basins and swales are Rain Gardens. A Rain Garden, also known as a vegetated infiltration basin, is a man-made or naturally occurring low spot in the landscape in which stormwater is collected and stored temporarily until it infiltrates into the ground. Rain Gardens are interesting solutions because they can be designed for recreation as well as serving their stormwater infiltration function. As a recreational civic space, Rain Gardens work well because they store rainwater during a storm event and shortly thereafter when people are not usually playing in parks. After the water percolates they are available as a park again. With some adaptation, Rain Gardens can be located in all settings, from the most rural to the most urban locations.

A more utilitarian solution that utilizes the same concept of short term storage and infiltration is the bioswale. Bioswales are linear depressions with gently sloping sides, planted with vegetation that treat stormwater runoff from rooftops, streets, and parking lots by slowing and filtering it as it passes through them and then channeling any excess water to the storm sewer. The naturalistic aesthetic of the plantings make them an excellent solution for rural and suburban applications.



## GREEN STREETS

Green Streets are thoroughfares that manage stormwater runoff at its source by incorporating vegetated water catchment and filtration devices in the form of small rain gardens and bioretention systems. Components such as flow-through planters and other sustainable stormwater solutions allow stormwater from the street to enter planters through cuts in the curb where the plant material removes impurities and allows water to naturally infiltrate or be stored elsewhere. Water-loving plants and those that are able to remove the impurities while thriving so close to traffic in more urban environments are used in green street design, adding beauty and function.



## RAINWATER HARVESTING

Harvesting rainwater is the collection and storage of rainwater that otherwise would be lost during a storm event. For centuries, rainwater has been collected for drinking, irrigation and other uses; however, since the advent of indoor running water, this practice fell out of favor. More recently, as sustainable resource use has increased, this practice has gained popularity. Rainwater is now being captured and used for washing cars, showering, flushing toilets, washing clothes, and in some places, even for drinking by treating it with ultraviolet light.

Rainwater can be harvested from rooftop or ground catchment systems, either in very simple or more complex systems, depending on the intended use of the water. Most systems are simple and consist of gutters and pipes attached to roofs channeling rainwater to a storage facility. The form of storage varies, based on the scale of the system and whether it is located in a more rural or urban setting. The most rural storage option is the pond. Cisterns, large concrete, wood or plastic storage chambers that often are installed underground, provide another storage alternative suitable for use both in rural and more urban areas.

A small storage alternative that works well for residential applications is the rain barrel. Rain barrels have become very popular in recent years and are sold even at nation chain grocery and hardware stores. Because these systems at their simplest can be added to existing gutter systems with little cost, rainwater harvesting is an easy strategy that should be widely implemented at all scales.



## GREYWATER RECYCLING

Greywater is water that has been used for laundering, dish washing and in showers and sinks. Depending on the local climate and soil conditions, it is possible to recycle grey water for several uses such as landscape and food irrigation or constructed wetlands. Recycling greywater reduces the amount of fresh water needed for each household and reduces the amount of wastewater entering the sewer system.



## XERISCAPING

Xeriscaping is a type of landscaping in which drought resistant plants that require small amounts of water and maintenance are used. While this practice can be utilized anywhere it is particularly important in arid climates where water shortages regularly occur. Because non-native plant species and varieties often require more water and care to ensure their survival, xeriscapes typically take advantage of native plants accustomed to the climate of the region in which they are planted. Other xeriscape practices include conserving the moisture in soil by mulching planting beds, drip irrigation, and using turf grasses in moderation.



XERISCAPE PLANTING STRIP, THREE SPRINGS, DURANGO, CO

## FOOD

### SELF-RELIANCE & FOOD SECURITY

As the cost of food and fuel increases, concerns rise about food security, or the idea that every person in a community will have consistent access to enough food to sustain a healthy and vigorous life. Because the majority of food for the average American travels about 1500 miles from the farm to the table, most families and communities, other than those who live on or near a farm, are in jeopardy if there is a disruption in long distance food shipping supply chain. As a general rule, the closer the food is to those eating it, the more secure it is. This long-distance method of acquiring food is inherently unsustainable in the long term and can result in a lack of food security, making it desirable to find other methods of maintaining a reliable supply of food.

Self-Reliance, also known as Urban or Backyard Homesteading, is a growing trend in which individuals, families, and communities seek to grow as much of their own food as is practical and provide for other basic necessities without much or any input from outside sources. These practices allow for food supplies to be secure because they are located in immediate proximity to and controlled directly by the consumers. In addition to larger conventional row crop techniques, several proven intensive, low-effort food-production systems have been created such as Square Foot Gardening, container gardening, and rooftop gardening. The scale of these food production techniques should be calibrated based on location in the community from rural to urban areas. Many of the larger farming options will likely be based on traditional row planting techniques; however with techniques such as the Square Foot Gardening method, an equivalent volume of food can be produced on 20 percent of the land, using less water and none of the fertilizer typically used in conventional growing.





**THE SCALE OF RURAL TO URBAN FARMING TECHNIQUES ARE AS FOLLOWS:**

**PRODUCTION FARMS** – Because of their large size, production farms should be located at the edge of a community. These farms are able to produce food on a regional scale as well as for the community in which they are located typically using row crop techniques.

**SMALL FARMS** – They are used to serve the immediate community and provide diversity to the supply of local food.

**BOUTIQUE AND HOBBY FARMS** – These are relatively small but are large enough for the farmer to sell the harvest commercially. Food produced from a boutique or hobby farm typically would be used by the farmer and sold in a farmers market or wholesale setting.

**COMMUNITY GARDENS** – This type of garden has seen acceptance in a wide range of settings in recent years. They may be part of a park or civic space. They work well in urban areas where land available to residents for individual gardens is limited. A Community Garden should produce a yield sufficient for participation of residents living in close proximity to it.

**YARD GARDENS** – These are appropriate for use on detached single family home lots for household use of the residents.

**CONTAINER GARDENS** – These gardens utilize containers to hold the planting medium and include window boxes, balcony and roof gardens. They can be used to provide household produce needs in more urban areas where space is limited.

**EDIBLE LANDSCAPES** – This refers to the utilization of plants and landscaping that produce edible food in settings that conventionally would have been limited to ornamental or non-food producing plants. Edible Landscapes are not a farm or garden per se, and unlike the farms and gardens described above (with the exception of the Community Garden), are not limited to use on private lots. There are many plants that are beautiful as well as produce food. In Italy, some areas utilize lemon trees as street trees. Other examples include using blueberry bushes, which make a nice hedge, and strawberries, which are a great groundcover.

## **COMMUNITY DESIGN & ARCHITECTURAL CONSIDERATIONS FOR FOOD PRODUCTION**

Every effort should be made through design to create communities and buildings that accommodate opportunities for food production at all scales from rural to urban. For example, on smaller lots it can be difficult to find more than a few feet that receive enough sun each day to grow fruits and vegetables. This can easily be alleviated with some forethought during the design of the community and the layout of houses on their lots. Additionally, portions of civic spaces within a community can be reserved for community gardens or utilize edible landscaping.



## ENERGY

### ENERGY EFFICIENT DESIGN

Energy efficiency is one of the greatest interests of the “green” design movement. There are high-, low- and no- tech solutions related to sustainable design, although it seems that high-tech solutions receive the most attention and enthusiasm. It is important to remember, however, that low- and no-tech solutions should be deployed first. Only after they have been fully explored and utilized should high-tech solutions be considered. Most of high-tech systems have some additional up-front costs associated with them, although those costs may be recovered in the long term through savings in operating costs. Low- and no-tech solutions, however, can be put in place more quickly due to the reduced initial capital cost.

Some low-tech solutions require a change in mindset and educating consumers. This is especially applicable to the way in which we conceive of air conditioning systems, lighting and building materials. Air conditioning should be viewed as a backup for cooling only on extremely hot days, replaced in part by ceiling fans and natural ventilation. Similarly, electric lighting requirements can be reduced by taking advantage of natural sunlight. Finally, there are a number of building materials and products, such as windows, doors, water heaters, appliances, and advanced insulating materials that have been developed specifically with a view toward energy efficiency.



## SOLAR ORIENTATION

Solar orientation is a no-cost energy efficiency solution in sustainable design. By taking solar orientation into consideration during the design process of not only buildings but entire neighborhoods, significant energy savings can be achieved. To ensure that passive solar heating, natural ventilation and daylighting can properly occur, window placement and size are critical as well as the inclusion of shading structures. In areas with smaller lots and buildings closer together, it is important to make walls facing neighboring homes light in color to reflect light into the house next door. In considering solar orientation in the design of the neighborhood, it must not be allowed to supersede considerations of walkable communities. Neighborhoods designed to encourage people to walk, bike or ride transit rather than driving have greater energy saving potential than small scale measures to make individual buildings more energy efficient.



## SHADE TREES

The use of trees planted around houses is a simple and beautiful solution to reducing heating and cooling needs for buildings. When planted on the south and west sides of buildings, shade trees drop their leaves during the cooler fall season allowing warming sunlight to reach buildings. Additionally, they create a lush canopy in the warmer months providing shade to keep the house cool. This provides, a low tech, low cost solution to reduce the energy needs of buildings.



## GREEN ROOFS

Green roofs are waterproof, vegetative roofing systems in which a root barrier, drainage system, light weight planting medium and plants are layered on top of an impermeable membrane. They serve to insulate the building, reduce heating and cooling costs, absorb heat from sunlight, and to limit solar heat reflection into the atmosphere which contributes to the phenomenon known as the “heat island effect”. Stormwater not used by the vegetation can enter and be stored in a collection system such as rain barrels or cisterns for later use. Green roofs are not only utilitarian, they can also be designed as an outdoor garden amenity. Finally green roofs can be used as part of an urban agriculture program to produce food for the building or others nearby.



GREEN ROOF, CHICAGO CITY HALL

## NATURAL LIGHT

Buildings should have a sufficient number of windows and shallow enough floor plates to meet the majority of the daytime lighting needs with natural light. The energy efficiency of natural lighting must be balanced against the increased air conditioning and heating demand that may be created by the use of additional glazing.



## VENTILATION & AIR CONDITIONING

A no-tech energy saving solution that has been used for centuries is natural ventilation. Natural ventilation is achieved by providing vents or windows in the upper and lower levels of a building. Warm air, which naturally rises, is allowed to escape to the outdoors from the upper vents and/or windows while cooler air is drawn into the building through the lower openings. Cross ventilation occurs when openings such as doors and windows, located on the same level on opposite or adjacent walls, are opened to allow cooler exterior air into the building, which, in turn, forces warmer interior air out.

One method to improve the efficiency of natural ventilation is a solar chimney, often referred to as a thermal chimney, which uses the convection of air heated by passive solar energy. In some instances the air is further cooled by movement through underground ducts before it enters the building. Electric fans, such as ceiling fans, allow efficient cooling and consume much less electricity than traditional air conditioning systems. When used in conjunction with some of the no-tech methodologies listed above, traditional air conditioning use can be significantly reduced or eliminated with little effort or energy consumption.



## ALTERNATIVE ENERGY

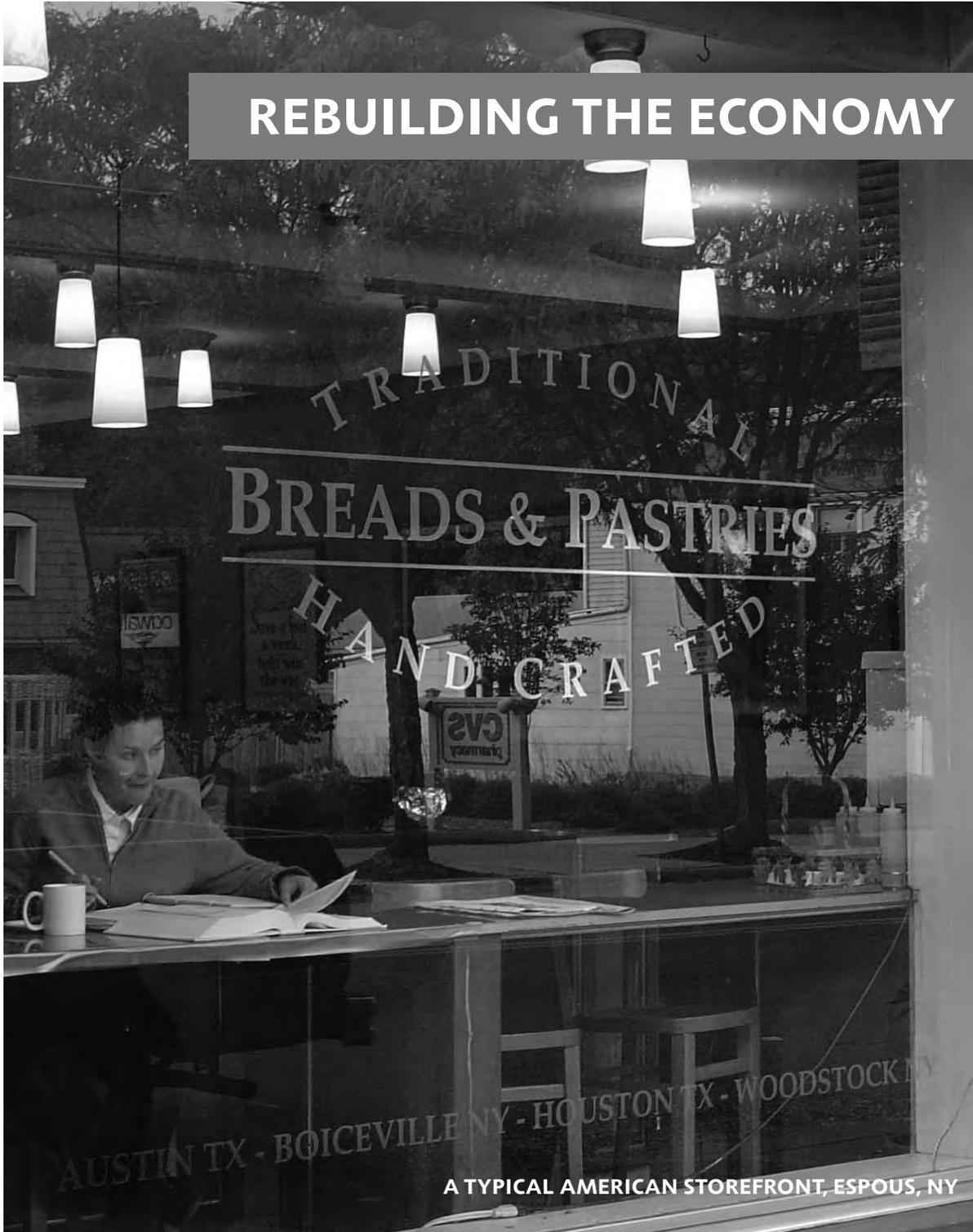
Due to the dwindling supplies of fossil fuels and recurring fuel shortages, alternative energy has become one of the most widely publicized elements of sustainability. There are many options available or being developed today to generate alternative energy. As these technologies become more widely utilized, the price continues to come down, alleviating concerns about the associated increased expense.

Alternative energy sources can be executed at all scales from city-wide to a neighborhood or an individual building. As with many of the elements in this Toolkit, the appropriateness of each solution should be based upon its scale and context. Solar energy collection is most appropriate in rural and suburban areas where there is ample roof space for each unit. In more urban areas, due to the space limitation, solar thermal collectors may be more feasible. Areas near rivers and streams may be able to implement micro hydro turbine technology to generate power using the current without needing a large dam. Wind power can be used in rural or urban areas. In more rural areas, large wind farms are appropriate, whereas in more urban areas, rooftops can be fitted with smaller scale vertical turbines.



SOLAR PANEL ROOF, GERMANY

# REBUILDING THE ECONOMY



A TYPICAL AMERICAN STOREFRONT, ESPOUS, NY

## REBUILDING THE ECONOMY

### AID WORKER DOLLARS

Immediately following the disaster and for many months or even years afterwards, there will be a steady stream of aid workers coming to town to assist in cleaning up and rebuilding the community. While these volunteers are there to lend a helping hand in the form of labor, they also can serve as a source of economic stimulus by spending their money in the communities they are there to help. It will be difficult for any local residents to provide goods and services to the aid workers, but once a sufficient amount of clean-up has taken place and infrastructure has been restored, it will be possible. While the financial impact of this may not be significant, it will have a beneficial effect on morale and may allow some of the community merchants to get back to business before local residents are able or willing to spend money.

**“WHILE VOLUNTEERS ARE THERE TO LEND A HELPING HAND IN THE FORM OF LABOR, THEY ALSO CAN SERVE AS A SOURCE OF ECONOMIC STIMULUS BY SPENDING THEIR MONEY IN THE COMMUNITIES THEY ARE THERE TO HELP.”**

### REBUILDING SEMINARS AND TRAINING PROGRAMS

Because the approach in this Toolkit is “cutting-edge”, after the rebuilding process has been underway for a while, communities that have utilized these techniques will have gained a lot of valuable knowledge. This information and the lessons learned through the process will be valuable to other communities that have gone through a disaster or are in disaster-prone areas and have the foresight to take a proactive approach. By offering rebuilding seminars and training to other communities, the impacted community can have both a good source of revenue and a way to share their knowledge with others.

### TOURISM

Because the main elements of this Toolkit deal with planning and rebuilding for a sustainable future and creating great places, there are several types of national and international tourism that can be cultivated even in a place that was previously only known to its residents.

## GREEN & ECOTOURISM

In the past two decades, a new type of tourism known as “Ecological Tourism” or more simply, “Ecotourism” has gained popularity around the world. Since 1990, The International Ecotourism Society (TIES) has defined ecotourism as “Responsible travel to natural areas that conserves the environment and improves the well-being of local people.” Due to the enthusiasm about sustainability and going “Green” that has swept across the world, many people are interested enough in places that have adopted and implemented these strategies to travel to these places to see the practices in action. Because of this, a new subset of ecotourism has been created which extends the concept of ecotourism from being located only in natural environments into human habitats such as cities and towns. Ecotourism can include sightseeing and educational tours of sustainable communities, LEED-certified buildings or infrastructure such as wind farms, as well as many other areas of interest to “Green” tourists.



## AGRITOURISM

In communities that embrace the local food production strategies in this DRPR Toolkit, an additional benefit to having a secure source of food, healthier food alternatives and decreased dependence on fossil fuels to transport their food long distances, is that many people are willing to pay to experience the rural character and authentic experiences associated with farming.

As suburban life spreads across the world, people became more and more removed from their food sources and the ability to “put their hands in the soil”. The big box retail, fast food lifestyle that is the essence of suburbia is so devoid of authentic experiences that suburbanites have become starved for more authentic life experiences. For years, suburban parents have taken their children to petting zoos where they might hold a lamb or feed a goat or stop at an orchard to pick fresh apples from the tree and paid an admission fee to do so. More recently, this search for authenticity has expanded to include a desire for an increased understanding of food sources, production and distribution techniques, organic food production, food movement, and “farm-to-table” options.

Agritourism, which is essentially another form of ecotourism, combines many of these concepts and taps into the human desire for authenticity and a more direct relationship with their food. People who are interested in having a more direct connection and better understanding of their food sources enjoy spending weekends on a farm, staying in a farmhouse, helping with planting, harvesting or tending to gardens and farm animals and preparing and eating meals derived from their efforts. Although this is a working vacation, agritourists find it so rewarding that they pay for their experience, just as if they were relaxing in a resort on a tropical island.

For these experiences to be successful, it is essential that they be authentic. In addition, educational programs about agriculture, sustainability and organic gardening help the agritourist learn while they are there so that they can return to their homes and start their own food sources. This lets them be repeatedly reminded of their agritourism experience, so that they may book another trip. Agritourism programs also can be modified slightly as day programs for school groups and parents and children during the week.

Additional sources of income for an agritourism operator can be generated through sales of harvested food, especially in a well-



designed and operated farmers market or roadside stand. CSA (Community Supported Agriculture) programs provide another possible food source option to communities in which residents can pay a monthly subscription to get their share of the CSA harvest each month.

While agritourism has traditionally been seen as an individual endeavor, we believe that with proper planning, an entire community or region can become an agritourism destination. This would require an innovative strategy that includes branding and marketing, infusing agriculture into all aspects of the community, such as having small demonstration plots in parks, edible streetscapes, festivals featuring seasonal harvests and programs in which the local restaurants use products that are grown and produced locally.

Agritourism at a community level is an economic development program and should be treated as such. It needs to be provided a budget and manpower necessary to make it thrive. Community agricultural plots should be thought of much in the way a town thinks about creating new parks or creating an economic development program. Accessibility and visibility are critical to the success. In some instances, we have even suggested creation of a new municipal staff position, the City Farmer. A portion of the City Farmer's salary could be paid with the support of proceeds from selling produce.





LOCAL MARKET

## PLACE-BASED TOURISM

Before the advent of niche tourism such as ecotourism and agritourism, most tourism and travel was typically place-based. People traveled to historic cities, town or villages around the world to significant sites and to experience being immersed in cultures different those they lived in daily. The key to this type of tourism is that it is dependent on a high quality built environment. This type of environment is defined by the characteristics of walkable communities with an overlay of history. These places that people travel across the world to visit are rich with authenticity and beauty. Ironically, the suburban places in which most people live today would never be visited by place-based tourists, because suburban environments are typically simply utilitarian, rather than interesting, beautiful and useful.

With the tools in the DRPR Toolkit, it is possible to create the type of place that may have never existed in a community before or to rebuild a place equal to its historic character before the disaster. Using these tools, communities can create the type of place where people will want to visit simply because of the high quality of the built environment. They will stroll the streets, eat at the outdoor cafes, shop in the interesting local shops and play in your beautiful civic parks. Walkable, connected, mixed-use, diverse places are highly desirable and any community can become such a place. It is possible to transform a city into a world-class destination without having the world's largest ball of twine or some other roadside gimmick.



## ECO-INDUSTRY

Often, companies that are in the business of producing goods and services related to sustainability and green building are not only concerned with profit, but also tend to take a more principle-based approach to doing business. They adopt a “triple bottom line” approach in which they are concerned about people, the planet and profit and aspire to “do well by doing good”. This socially, environmentally and financially responsible model makes it difficult for companies like this to be taken seriously if their physical presence, identified by their stores and factories, do not follow the principles of their corporate mission. As a result, companies in “green” industries seek out communities that embrace these same philosophies and actively encourage these companies to locate in their city. Becoming well known as a “green” city that is “open for business” to “green” and sustainable companies will go along way toward attracting these eco-industry operations.



## PLACE-BASED INDUSTRY

In today's idea-based economy, where creativity and innovation are valued even more than experience and seniority, a new type of business environment has taken shape. The internet and other technology has bridged the gap of distance, time, and proximity to natural resources that is no longer important for many industries. The new resource is creative people.

The office park of the 80's and 90's has been replaced with mixed-use corporate campuses and urban lofts and warehouses. Previously, municipalities competed to attract business with the tax breaks or Class A office space. Today many companies will not locate in a community that does not have a built environment that is walkable, mixed-use and diverse. This is because the best employees they hope to attract will not settle for a suburban lifestyle anymore and will only work for companies with offices in vibrant cities with active street life and culture. Once again, these employees are seeking authentic experiences extended to their work life, social experiences and the community in which they live.

Because of this shift in corporate culture and mindset, it is important first to create the type of environments these companies are looking for and then rigorously tailor your marketing message to feature the fact that your municipality has the type of built environment they are looking for. Investments in place-making will pay off and should be considered an important economic development program, rather than just a quality of life benefit to existing residents.



## EXISTING & NEW BUSINESS INCUBATOR

Following a disaster, there may be massive destruction of buildings which formerly housed business. These stores and businesses form the commercial foundation of a community, both in tax base and socially. It is important to get these businesses up and running as soon as possible. It will serve as a morale booster and begin to generate taxes. It is possible to expedite the process of getting businesses operating again by providing an incubator space. It will need to be built more quickly than repairs to a disaster damaged building could take place.

The incubator could be a light weight structure that is modular and moveable, or it could be permanent and be built in the place where the commercial center of the community previously existed. The approach will need to be calibrated to the extent of the damage in the community. Modest rents would be charged during the business start-up phase with the understanding that they will move out of the incubator and into their own space once they are more established. After all of the existing businesses have cycled through the incubator, a permanent incubator building could transition to the task of incubating new businesses in the community, after all of the existing businesses have cycled through.



**“IT IS IMPORTANT TO THINK CREATIVELY ABOUT THE COMMUNITY’S NEEDS AND EXPAND THE FIELD OF VIEW TO LOOK ‘OUTSIDE THE BOX’ AT GRANTS WHOSE RELEVANCE IS NOT IMMEDIATELY APPARENT TO A COMMUNITY’S NEEDS.”**

### GRANTS FOR REBUILDING

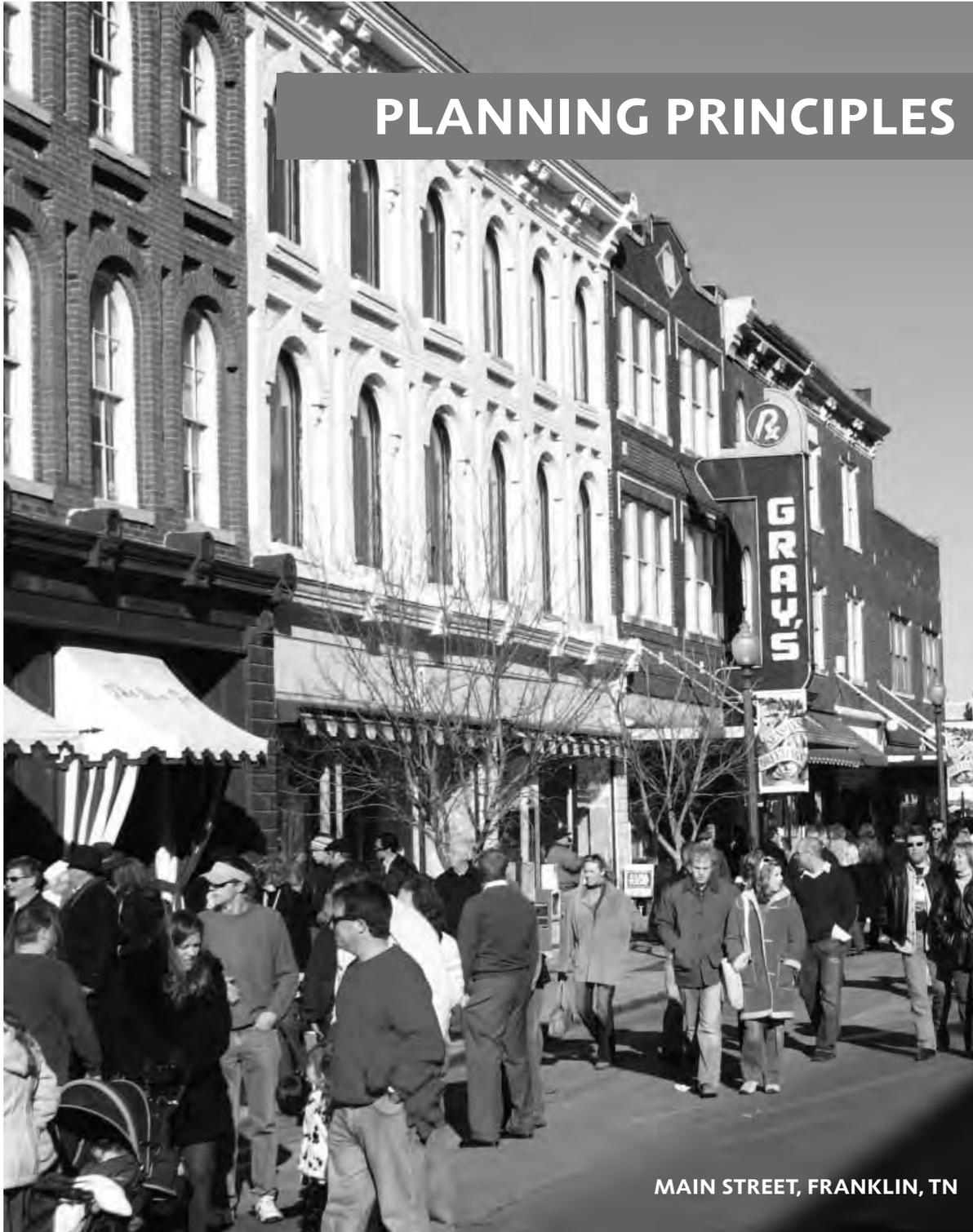
In addition to federal aid money that is available for disaster relief and rebuilding, there may be grants specifically available for some of the programs contained in this toolkit. There are grants that are targeted for sustainability like the USDA Renewable Energy System and Energy Efficiency Improvements Grants, historic preservation, agricultural programs such as the USDA Rural Business Opportunity Grant (RBOG), master planning grants, façade improvement grants and grants for other improvement projects. It may be necessary to employ a full time grant writer or find one willing to work on commission. When seeking these grants, the more professional the application and clearer the vision for the future, the greater the chance of being awarded the grant. It is important to think creatively about the community’s needs and expand the field of view to look “outside the box” at grants whose relevance is not immediately apparent to a community’s needs.





**TPUDC DOWNTOWN PLAN FOR LIVABLE CENTERS INITIATIVE GRANT RECIPIENT,  
MONROE, GEORGIA**

# PLANNING PRINCIPLES



MAIN STREET, FRANKLIN, TN

## PLANNING PRINCIPLES

**TAKEN TOGETHER THESE ADD UP TO A HIGH QUALITY OF LIFE AND CREATE PLACES THAT ENRICH, UPLIFT, AND INSPIRE THE HUMAN SPIRIT.**

The standards and principles of Smart Growth and New Urbanism are designed to make areas more livable, more vibrant, more people-oriented, and to build community pride in the community.

The pedestrian-oriented, historic areas of the city share a number of desirable characteristics that provide the community many benefits. We should strive to preserve, celebrate, encourage and emulate how these areas are designed because of such benefits. For example, a traditionally designed city provides the following benefits:



**“SUMMED UP THERE ARE THREE CONSTITUENT ELEMENTS OF WALKABILITY. THE 3 D’S: DISTANCE, DESTINATION, AND DESIGN.”**

## WALKABILITY

The term walkability has become a buzz word in recent years without much effort to provide definition. As a result, it is often misunderstood to mean a place that would be pedestrian only or anti-automobile. In fact, the term describes an environment where there is balance between many modes of transportation, including the automobile. Most importantly, it describes an environment in which people feel comfortable walking. Summed up, there are three constituent elements of walkability we call “The 3 D’s”: Distance, Destination, and Design.

The average pedestrian is willing to walk up to one-quarter of a mile (1320 feet, 0.4 km) or roughly five minutes to a meaningful destination. This ¼ mile or five minute walk from the edge to a meaningful destination at the center is called a “pedestrian shed”. Distances requiring more than a five minute walk typically will be covered by most Americans in a car rather than by walking. This walking vs. driving threshold is locally calibrated. In some areas with particularly pleasant climates or fit residents, this distance could be increased. In locales with steep terrain or very hot, cold or rainy climates, this distance would be decreased. In other parts of the world where the automobile has less prominence in daily life due to high fuel prices and the inconvenience of driving, this distance is again increased as walking provides an even more attractive option.

Meaningful destinations may include a multitude of uses and activities. These include civic spaces such as parks, plazas, squares or greens, as well as schools, meeting halls or other civic institutions. These civic spaces and institutions are used more frequently when residents have easy access to them on foot rather than in an automobile. In addition, meaningful destinations may include commercial areas like neighborhood or town centers where daily or weekly shopping needs can be met. Many of these destinations, when centrally located, can become the “heart” of the community.

In addition to proximity and the uses and activities found at meaningful destinations, the third component of walkability may be the most important - the design considerations and elements of walkable streets. It is important in the design of walkable places to create a sense of enclosure and human scale by pulling buildings closer to the street and not allowing large expanses of asphalt to dominate the frontage of buildings. Pulling the buildings closer to the street gives pedestrians something interesting to see as they pass the time walking. Additionally, the elements of the buildings are pulled closer to the streets, such as porches, doors and windows, emphasizing this human-scale and the relationship of buildings to passersby. The buildings being located closer to the street creates a sense of enclosure.

It seems elementary but bears stating, with the exception of very rural areas where automobile traffic is very limited, sidewalks of sufficient

size are a necessity in creating a walkable environment. The widths of sidewalks should vary from narrowest, five feet minimum, in the rural and suburban areas; to fifteen to twenty-five feet in the most urban areas.

Due to the fact that the sidewalks are located in close proximity to the streets, it is necessary to provide a means by which people feel comfortable walking a matter of feet from automobile traffic. The provision of street trees, which should be situated between the sidewalk and the street, allow the pedestrian to feel protected from the traffic.

While street trees serve as a barrier between pedestrians and moving vehicles, they also create dappled shade which creates visual interest and cools the sidewalk while enhancing the sense of enclosure with their canopy. Additionally, they cause drivers to proceed more slowly. As it is pedestrians' tendency to avoid moving cars, their comfort level increases the slower the cars are moving. These measures that slow automobiles increase walkability.

In addition to the street trees, on-street parking serves to give the driver the sense that the roadway is narrow, causing them to pay closer attention while driving, translating to slower driving speeds. However, this only works if the travel and parking lanes are actually narrow. Wide lanes, whether or not on-street parking and street trees are present, produce higher traffic speeds. Studies have shown that the wider the thoroughfare, the higher the speed of traffic. This is true regardless of the posted speed limit. Obviously, the higher the speed of the cars, the more severe the injuries during pedestrian vehicular conflict. Pedestrians are sensitive to unsafe environments, and if vehicles are moving at a high rate of speed, it is less likely that people will walk in that area.



## CONNECTIVITY

Unless there are topographic or ecological constraints prohibiting it, the use of dead end streets or cul de sacs should be avoided. All streets should be connected to another street within and outside the neighborhood. This approach results in an interconnected hierarchical network of thoroughfares that defines the block structure of the neighborhood. The thoroughfare network provides a multitude of routing alternatives to and from all destinations in the neighborhood, dispersing traffic and limiting congestion. Because of the narrow network of streets, connectivity makes the neighborhood safer by allowing emergency service vehicles many options to get to the site of an emergency call if they encounter a street that is blocked and daily traffic moves at slower speeds.

Connectivity is also beneficial to pedestrians, as a network of sidewalks, paths, and passages makes walking more convenient and enjoyable and increases pedestrian access throughout the community. Finally, by increasing the number of routes through the community, pedestrians are provided more interesting walking and jogging alternatives and more opportunity for social interaction.



## MIXED-USE

Whenever possible, neighborhoods should include a mix of commercial (retail, restaurants and offices), residential, recreational and civic uses. This mix should be well-balanced and incorporate vertical as well as horizontal mixed-use within the neighborhood, the block, and the building. An ideal mix would allow residents to meet all of their daily needs within a short walking distance. When this occurs, the number of automobile trips per household is substantially reduced. This mix of uses is optimized when commercial establishments have residential dwelling units above to ensure that the street is always active.



MIXED-USE STREETScape, CHARLESTON, SC

**MIXED HOUSING & DIVERSITY**

Demographic diversity of people in age, income level, culture, and race provides a sense of interest and vitality to the most loved cities in the world. In order to attract this type of diversity to a community, the physical form must be conducive to their varied lifestyles. A key component to creating an environment where diversity thrives is the provision of a mix of housing options. There should be many different types, sizes and price points of housing intermingled in close proximity rather than being separated. The community should include a range of living experiences from rural to urban.

The variety of dwelling types should include: different sizes of detached single family houses, rowhouses, apartments and live-work buildings. In addition, small ancillary buildings with a living space above the garage should be permitted within the rear yard of each principal building house for extended family, tenants or guests to stay or live. Residential units should be available either for leasing or for ownership. This allows young and old, singles and families, and residents having a range of income levels to find dignified places that suit their preferences and lifestyles. An additional benefit of this mix of housing types is that workers can live within walking distance of their jobs, rather than requiring that they commute to work, worsening traffic problems.



**SMALL COTTAGE**



**MIXED-USE CONDOS**

## NEIGHBORHOOD STRUCTURE

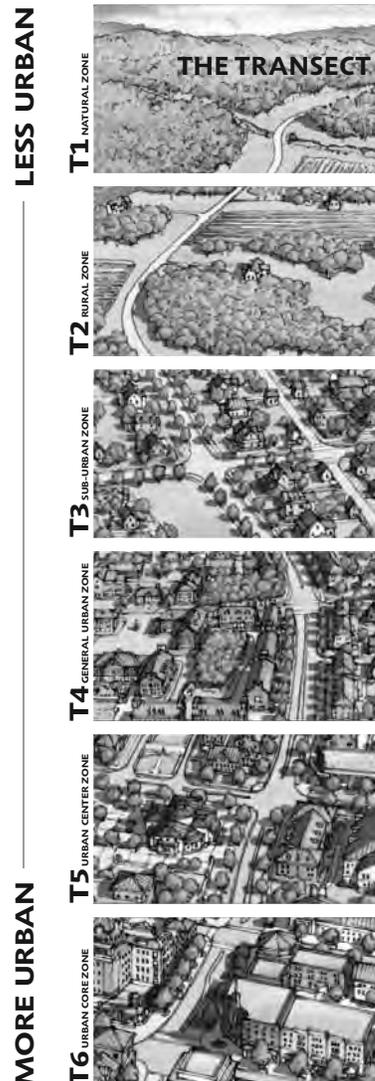
Neighborhoods should contain a discernible center and clear edge. This is an organizational concept that provides an identity to the community. While it may be more difficult to have a well-defined edge surrounding a neighborhood, it is imperative that its center be well formed. The center of the neighborhood should include a civic open space such as a park, square or plaza depending on its location within the range of contexts, from rural to urban. This center should have the most urban character in the community, with buildings pulled up close to the street and a generous sidewalk in front. If transit is available in the community, the transit stop would be found in the neighborhood center.



**NEIGHBORHOOD STRUCTURE, THE MEADOWS  
BUENA VISTA, CO**

## THE TRANSECT

The Transect is a sequence of six environments or character zones from rural to urban. All elements of design should be arranged according to this conceptual framework, from untouched nature to man-made urban centers. The least intense rural environments are found in the T1 Natural Zone (T1) progressively getting more intense and culminating in the most intense urban environment the Urban Core Zone (T6). Elements such as density, plantings, setbacks, building heights, signage, lighting, thoroughfare design and other elements are variable but still holistically coordinated based on each Transect Zone.



## COMPACT DEVELOPMENT: APPROPRIATE LIVABLE DENSITY

Compact development is an effective method to preserve land having agricultural, habitat, or scenic value. While it may not be the preference of all citizens, the most sustainable way to develop is with higher densities. However, simply building more densely without taking into consideration the local market preferences of potential buyers will end in failure.

A sophisticated and nuanced approach is required, as is the recognition that there is no “one size fits all” solution. Utilizing the concept of the Transect, there will be a range of densities within community translating into a multitude of lifestyle choices for residents, from more rural to more urban, or put differently, from more sparsely developed to more densely developed. The overall density of a neighborhood may be higher than a conventional development of the same size, but within the neighborhood, some areas may have lower density than the average lot in the conventional neighborhood.



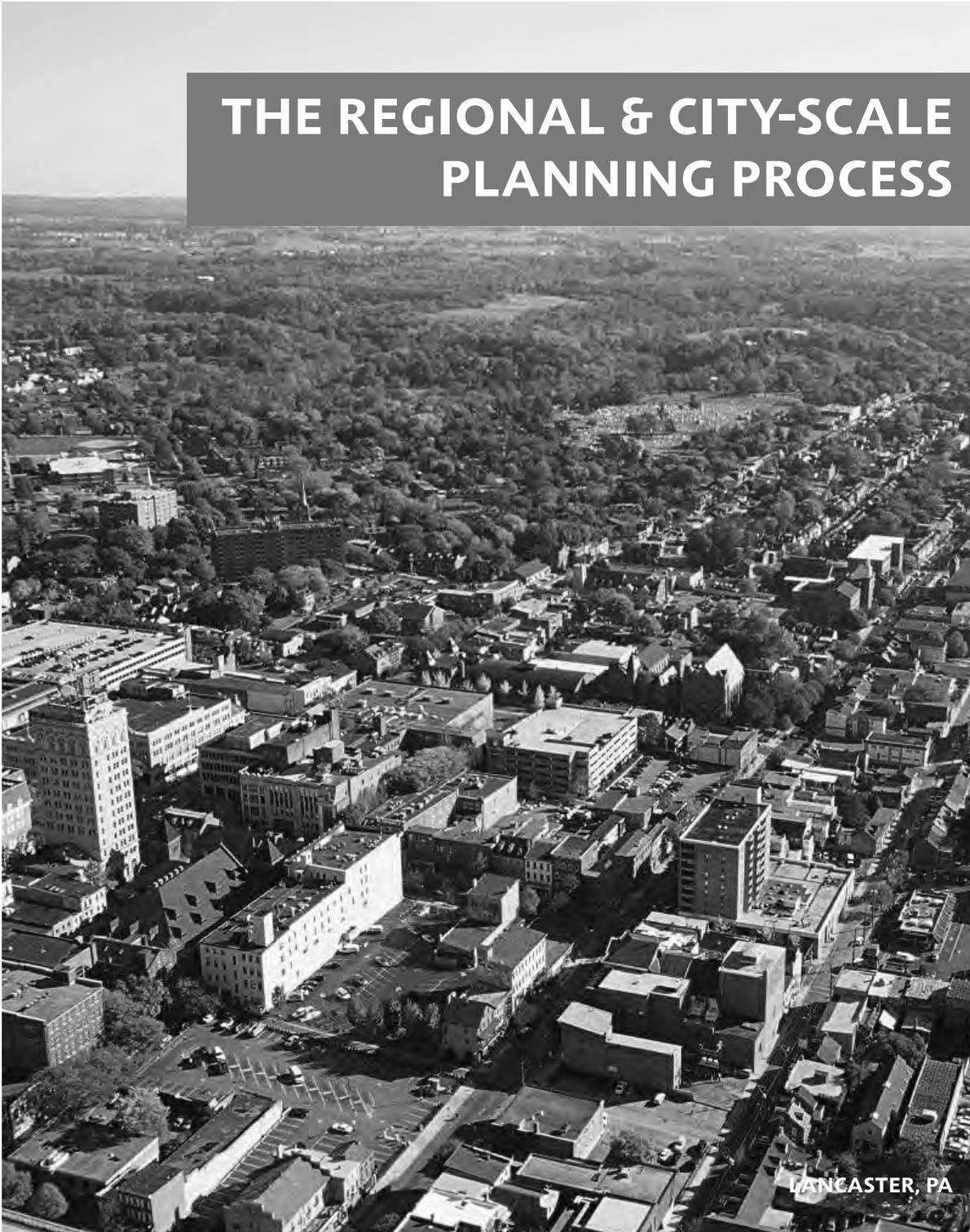
## TRANSPORTATION ALTERNATIVES

It is imperative that choices be provided for alternatives to driving, such as bicycling, walking and using public transit including bus, trolley, or light rail. While driving is not to be shunned, it should certainly not be the only option. Pedestrian-friendly neighborhood design is important to ensure a greater inclusion of alternative modes of transportation.





# THE REGIONAL & CITY-SCALE PLANNING PROCESS



LANCASTER, PA

## REGIONAL & CITY-SCALE PLANNING PROCESS

### SEIZE THE OPPORTUNITY

An entire region or City may be adversely impacted following a significant natural disaster. Coordinated planning efforts at the regional scale are unique opportunities for communities to collectively determine a vision for their future. Such efforts can maximize efficiency and minimize duplicate efforts with the limited resources of impacted areas.

**“COORDINATED  
PLANNING EFFORTS  
AT THE REGIONAL  
SCALE ARE UNIQUE  
OPPORTUNITIES  
FOR COMMUNITIES  
TO COLLECTIVELY  
DETERMINE A  
VISION FOR THEIR  
FUTURE.”**

### IDENTIFY PRIORITY ZONES

Immediately following a disaster, “Priority Zones” should be identified as quickly as possible. During the subsequent Survive and Thrive Phases, specific strategic locations must be identified to concentrate efforts in the most efficient manner. These Priority Zones may be neighborhood centers, transit hubs, or other identifiable physical locations within a community.

Teams should identify not only the most adversely impacted areas but also those most intact and best suited for rapid redevelopment and functional operation. Initially, such areas may simply serve as staging areas for aid workers to provide critical human needs. Later, these areas can transform into vibrant community hubs of activity and culture.

### IMPORTANCE OF CODING

While planning and community involvement are critical to successful regional planning efforts, the importance of the coding work itself is often underestimated or ignored. It is this element that makes the vision legal and binding and provides protection to communities and certainty to real estate professionals, developers and homeowners.

Following the Survive Phase, communities and their planning consultant must reexamine their existing ordinances. It is highly likely that these documents will need to be consolidated, simplified and updated to reflect the desires of the community, reactions to the disaster and advances in coding, such as form-based coding.

**“IN THIS WAY,  
A REGION  
OPERATING  
UNDER THE SAME  
MASTER (FORM-  
BASED) CODE WILL  
EVOLVE IN A MORE  
COHESIVE AND  
HARMONIOUS  
MANNER.”**

## **FORMULATION AND IMPLEMENTATION OF A FORM-BASED CODE IN A MULTI-JURISDICTIONAL FRAMEWORK**

Often municipalities do not undertake the coordination of multi-jurisdictional planning or coding, but find themselves needing to following a disaster of regional impact. Regional codes (ideally form-based codes) should include provisions for all scales of development, rather than picking only one or two scales.

A regional sector plan containing specific areas for future growth and preservation can inform the types and intensities of various communities in each jurisdiction. Each of those community types in turn will be comprised of various allocations of transect or character zones, in which various elements of buildings and lots are prescribed.

Under this structure, a community regulating plan submission would be required to comply with the regional sector plan as a condition to approval under the form-based code. In this way, a region operating under a common regional code will evolve in a more cohesive and harmonious manner and economies of collaboration in infrastructure decisions can be achieved.

A jurisdiction may want to provide for community regulating plans that are consistent with the sector plan, the applicable initial community regulating plan or the code's requirements to be entitled to administrative approval by right. Plans that are not in keeping with the sector plan or the requirements for community regulating plans would require approval by under the full existing regulatory process.

There are a number of ways in which a form-based code and sector plan could be implemented over a regional area. One possible way would be to develop the sector plan using specific criteria of the form-based code for designating the various open space and growth sectors. The resulting sector plan would become the sector plan for all of the participating jurisdictions. In addition to a charrette, a meeting with representatives of all of the jurisdictions to reach consensus on the details of the sector plan for the area is recommended.

Alternatively, each jurisdiction could adopt its own sector plan using the criteria provided in the form-based code. Even without intentional efforts to reach consensus on a single sector plan, the use of those

criteria would result in the aggregate of the separate sector plans that are substantially similar to a single consensually developed sector plan derived from those same criteria.

Each jurisdiction would be able to amend its sector plan in accordance with the criteria of the code, or if an amendment would be outside of those criteria, could commit to consult with the other jurisdictions prior to amending it.

**CITY OF COLUMBIA FORM-BASED CODE** **TPUDC**  
Columbia, Tennessee

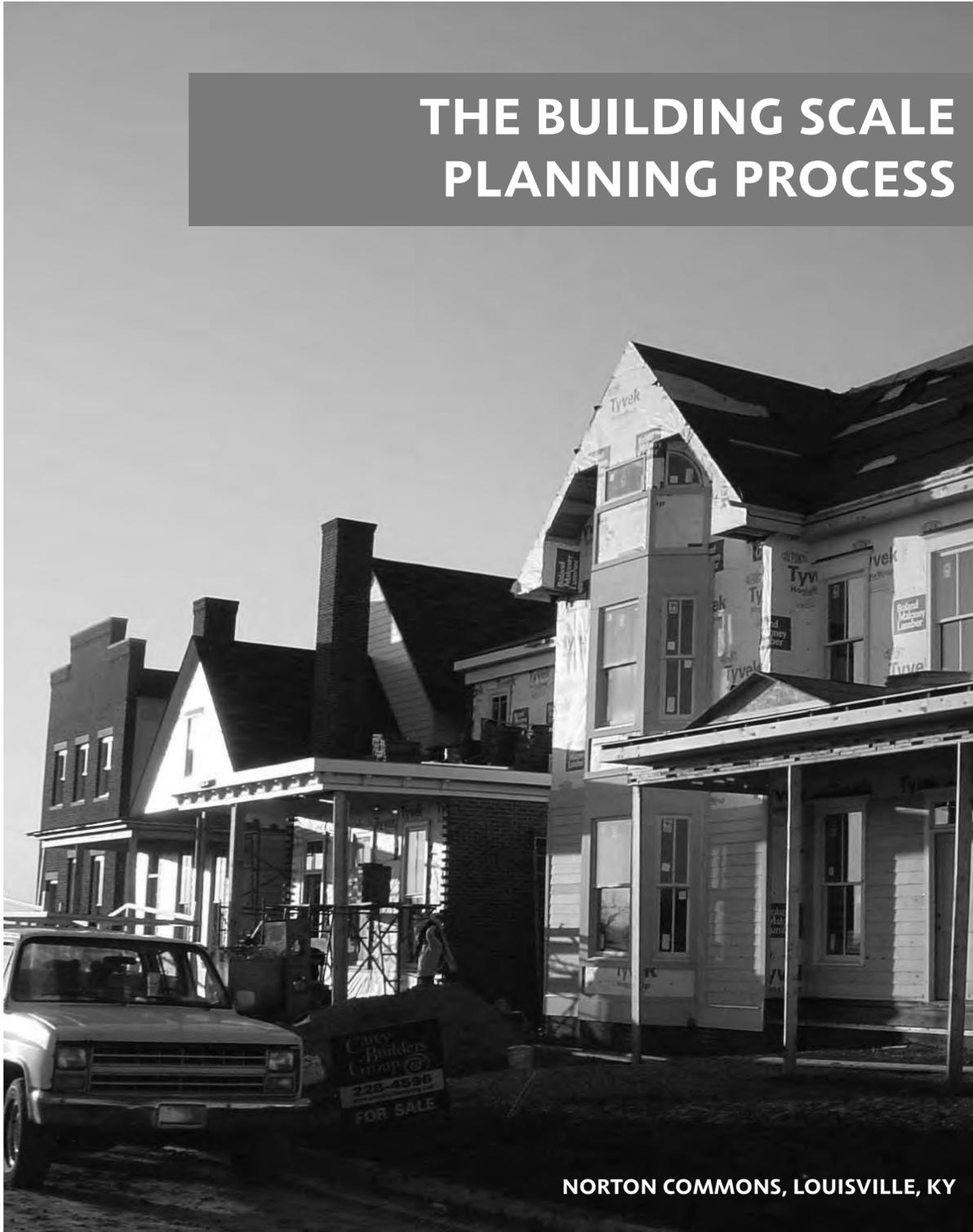
**Signage Introduction:**  
The signage in the City of Columbia will be following eight types: Painted Wall Signs, Window Signs, Blade Signs, Postal Numbers, Plaque Signs, Band Signs, Awning Signs or Sandwich Signs. Each of these sign types is appropriate depending on its location on the building and its location in the transect. Below is an illustration showing the location of each of the signage types and its typical scale and location on a business. It is not typical that each of these signage types will be used on a single business or facade. The permitted number and size of signage is found in the Signage Specific Standards on the following pages:

<p><b>A Painted Wall Sign:</b> Painted wall signs are large signage murals painted directly on a building wall.</p>	<p><b>B Window Sign:</b> Window signs are painted and applied directly on the inside of a window.</p>	<p><b>C Blade Sign:</b> Blade signs are small, two-sided, pedestrian-scale signs mounted with decorative metal brackets perpendicular to a building's facade.</p>	<p><b>D Postal Numbers:</b> Postal numbers are small signs consisting only of the address of the building. These are located on or near the front door of the business.</p>
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<p><b>E Plaque Sign:</b> A plaque sign is a small metal or stone sign located in an inconspicuous location with the date of construction and/or the architect of the building.</p>	<p><b>F Band Sign:</b> Band Signs are a horizontally oriented signage type applied directly to the facade of a building. They may be one unit applied or painted or consist of individual letters attached to the "expression line" or entablature of the building.</p>	<p><b>G Awning Sign:</b> Awnings signs are painted, screen printed, or applied to flat or angled storefront shade structures. They may be located on the drip edge and/or the main body of the awning.</p>	<p><b>H Sandwich Sign:</b> Sidewalk signs are a secondary signage type used to promote daily specials and sales, or give directions to businesses without a sidewalk presence. These may have handwritten elements.</p>
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**FBC1 Article 7 - Definitions** www.tpudc.com  
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# THE BUILDING SCALE PLANNING PROCESS



NORTON COMMONS, LOUISVILLE, KY

## THE BUILDING SCALE PLANNING PROCESS

Building techniques following a disaster need to be context sensitive and drawn from local traditions that have developed organically over time as natural responses to environmental factors. Different disasters present unique building and rebuilding challenges. For example, areas prone to earthquakes require different construction techniques than those areas effected by hurricanes.

**“BUILDING TECHNIQUES FOLLOWING A DISASTER NEED TO BE CONTEXT SENSITIVE AND DRAWN FROM LOCAL TRADITIONS THAT HAVE DEVELOPED ORGANICALLY OVER TIME AS NATURAL RESPONSES TO ENVIRONMENTAL FACTORS.”**

### EARTHQUAKES

Structures located in areas prone to seismic activity should be designed for seismic resistance. This can be achieved through the use of a variety of structural systems including shear walls, moment frames, damper systems and braced frames.

### HURRICANES AND TORNADOES

Maintaining the integrity of the building envelope is the single most important consideration for structures located in areas prone to hurricanes and tornadoes. This can be achieved through the use of roof bracing, hurricane straps, minimizing overhangs where possible, the use of impact resistant windows and doors, upgraded roof structures and finishes, the use of storm shutters, and multiple point door locking mechanisms. These techniques will help structures to resist the lateral and uplift forces so damaging in these types of natural disasters.

### WILDFIRES

Structures located in areas prone to wildfires should have a cleared safety zone free of combustible vegetation surrounding them. This zone should consist only of fire-resistant ground cover and plantings. Exterior building materials (especially roofs) in these areas should be made of fire-resistant materials. Roof vents and other exterior openings should be covered with wire mesh to prevent embers from entering. Chimneys also should be outfitted with spark arrestors. Windows and doors should use multi-pane thermal glass. Such structures should also be sited in such a way as to counter the effects of flooding and mud slides that may result from erosion following the burning of surrounding vegetation.

## GREEN BUILDING & SUSTAINABILITY

Wherever possible, the elements of sustainability should be incorporated at all scales during the rebuilding process, regardless of the disaster one is recovering from planning for. Nowhere is this more apparent than during the building scale process. There are currently numerous sustainability rating programs, including the most prominent: LEED - Leadership in Energy and Environmental Design. These standards should be used to inform everything from global design decisions down to specific material selections.





LEED OFFICE BUILDING (BACKGROUND), PORTLAND, OR

# APPENDIX



GETTYSBURG, PA

## THE CHARTER OF THE NEW URBANISM

**The Congress for the New Urbanism** views disinvestment in central cities, the spread of placeless sprawl, increasing separation by race and income, environmental deterioration, loss of agricultural lands and wilderness, and the erosion of society's built heritage as one interrelated community-building challenge.

**We stand** for the restoration of existing urban centers and towns within coherent metropolitan regions, the reconfiguration of sprawling suburbs into communities of real neighborhoods and diverse districts, the conservation of natural environments, and the preservation of our built legacy.

**We advocate** the restructuring of public policy and development practices to support the following principles: neighborhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice.

**We recognize** that physical solutions by themselves will not solve social and economic problems, but neither can economic vitality, community stability, and environmental health be sustained without a coherent and supportive physical framework.

**We represent** a broad-based citizenry, composed of public and private sector leaders, community activists, and multidisciplinary professionals. We are committed to reestablishing the relationship between the art of building and the making of community, through citizen-based participatory planning and design.

**We dedicate** ourselves to reclaiming our homes, blocks, streets, parks, neighborhoods, districts, towns, cities, regions, and environment.

CONGRESS  
FOR THE  
NEW  
URBANISM

## THE CHARTER OF THE NEW URBANISM

### THE REGION: METROPOLIS, CITY, & TOWN:

CONGRESS  
FOR THE  
NEW  
URBANISM

- 1) Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made of multiple centers that are cities, towns, and villages, each with its own identifiable center and edges.
- 2) The metropolitan region is a fundamental economic unit of the contemporary world. Governmental cooperation, public policy, physical planning, and economic strategies must reflect this new reality.
- 3) The metropolis has a necessary and fragile relationship to its agrarian hinterland and natural landscapes. The relationship is environmental, economic, and cultural. Farmland and nature are as important to the metropolis as the garden is to the house.
- 4) Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion.
- 5) Where appropriate, new development contiguous to urban boundaries should be organized as neighborhoods and districts, and be integrated with the existing urban pattern. Noncontiguous development should be organized as towns and villages with their own urban edges, and planned for a jobs/housing balance, not as bedroom suburbs.
- 6) The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.
- 7) Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes. Affordable housing should be distributed throughout the region to match job opportunities and to avoid concentrations of poverty.
- 8) The physical organization of the region should be supported by a framework of transportation alternatives. Transit, pedestrian, and bicycle systems should maximize access and mobility throughout the region while reducing dependence upon the automobile.
- 9) Revenues and resources can be shared more cooperatively among the municipalities and centers within regions to avoid destructive competition for tax base and to promote rational coordination of transportation, recreation, public services, housing, and community institutions.

## THE CHARTER OF THE NEW URBANISM

### THE NEIGHBORHOOD, THE DISTRICT, & THE CORRIDOR:

CONGRESS  
FOR THE  
NEW  
URBANISM

- 10) The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.
- 11) Neighborhoods should be compact, pedestrian friendly, and mixed-use. Districts generally emphasize a special single use, and should follow the principles of neighborhood design when possible. Corridors are regional connectors of neighborhoods and districts; they range from boulevards and rail lines to rivers and parkways.
- 12) Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.
- 13) Within neighborhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.
- 14) Transit corridors, when properly planned and coordinated, can help organize metropolitan structure and revitalize urban centers. In contrast, highway corridors should not displace investment from existing centers.
- 15) Appropriate building densities and land uses should be within walking distance of transit stops, permitting public transit to become a viable alternative to the automobile.
- 16) Concentrations of civic, institutional, and commercial activity should be embedded in neighborhoods and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them.
- 17) The economic health and harmonious evolution of neighborhoods, districts, and corridors can be improved through graphic urban design codes that serve as predictable guides for change.
- 18) A range of parks, from tot-lots and village greens to ball fields and community gardens, should be distributed within neighborhoods. Conservation areas and open lands should be used to define and connect different neighborhoods and districts.
- 19) A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.

## THE CHARTER OF THE NEW URBANISM

### THE BLOCK, THE STREET, & THE BUILDING:

CONGRESS  
FOR THE  
NEW  
URBANISM

- 19) A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.
- 20) Individual architectural projects should be seamlessly linked to their surroundings. This issue transcends style.
- 21) The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.
- 22) In the contemporary metropolis, development must adequately accommodate automobiles. It should do so in ways that respect the pedestrian and the form of public space.
- 23) Streets and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.
- 24) Architecture and landscape design should grow from local climate, topography, history, and building practice.
- 25) Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.
- 26) All buildings should provide their inhabitants with a clear sense of location, weather and time. Natural methods of heating and cooling can be more resource-efficient than mechanical systems.
- 27) Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society.

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Department of Environmental Services

# DISASTER RESPONSE: PLANNING + REBUILDING TOOLKIT

VERSION 1.1



**MISSISSIPPI STATE**  
UNIVERSITY  
**EXTENSION SERVICE**

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