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SMART CODES

in Your Community



A Guide to Building Rehabilitation Codes







SMART CODES in Your Community

Prepared for the

Department of Housing and Urban Development
Office of Policy Development and Research
Washington, DC 20410

Prepared by

Building Technology, Inc.

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FOREWORD

Home ownership has reached record highs over the last few years. Despite this demand for new homes and community structures, there are still many barriers to reusing the structures that currently stand in America's cities and towns but that are vacant or require rehabilitation. While cities and towns get larger, many of the existing buildings are underutilized or deteriorating. This problem has many sources, including zoning regulations and building codes. Many policy initiatives at the Federal, state, and local levels have been directed at controlling this disparity. A central feature of these initiatives is the development of methods to encourage the revival and reuse of existing neighborhoods and buildings. Commonly known as "smart growth" initiatives, policies from land use initiatives to "smart codes" have been actively supported by the US Department of Housing and Urban Development (HUD). Recently, HUD published the Nationally Applicable Recommended Rehabilitation Provisions, or NARRP, as a "smart code" model for state and local jurisdictions interested in finding building code methods for encouraging the alteration and reuse of existing buildings. The document provided here is a thorough but easy-to-read guide for communities and community advocates of all kinds that walks through the steps for developing your own "smart code," including looking at the NARRP as a starting point. Ultimately, changing the regulatory environment will improve the redevelopment of existing communities. Documents like the NARRP and HUD's many other rehabilitation tools that deal with the construction and regulation of buildings help with that process. We invite communities to read these reports and guides, and look out for further tools from HUD. Lawrence L. Thompson General Deputy Assistant Secretary for Policy Development and Research



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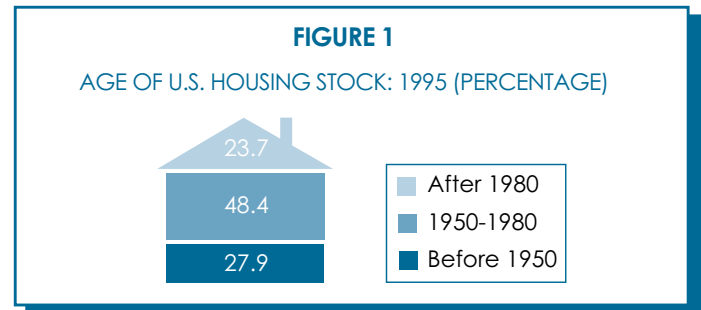
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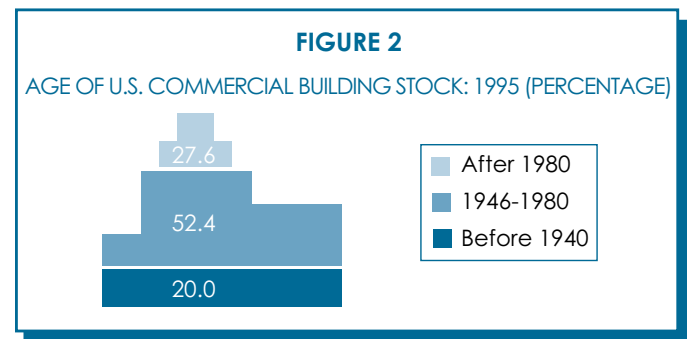
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1 INTRODUCTION/HOW CAN “SMART CODES” LIKE THE NARRP HELP YOU?

The age of the building stock in the US—residential, commercial and industrial—is increasing. In 1995 the median age of the housing stock was nearly 30 years, and almost 30% of housing units were constructed before 1950. A similar situation applies to commercial buildings.



Source: American Housing Survey for the United States, U.S. Department of Commerce/U.S.I Department of Housing and Urban Development, 1997.



Source: Commercial Building, U.S. Department of Energy, 1998.

At the same time, urban development in most parts of the US is typified by rapid suburban growth and expansion into the open areas adjacent to cities and towns. While each community is unique—the product of its particular locale and history—chances are that your community displays some form of these symptoms:



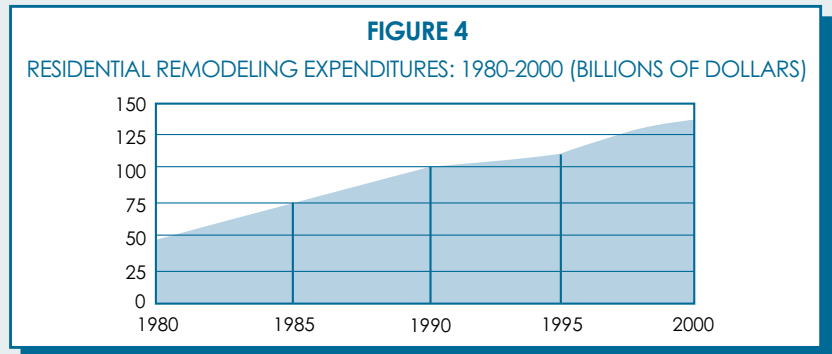
- An older downtown with underutilized and deteriorating buildings.
- Commercial activity shifted from downtown to suburban hubs and malls.
- A decreased and decreasing downtown tax base.
- Urban and suburban sprawl at the peripheries.
- Gridlock on roads and highways, with citizens spending increasing amounts of time commuting.

While investment in existing buildings (remodeling, renovation, and adaptive re-use) has increased significantly nationwide in recent years, it has not reversed development patterns.

Recent policy initiatives at the federal, state and local levels have been directed at managing uncontrolled urban growth. A central feature of these initiatives is the development of methods to encourage the revival and reuse of existing neighborhoods and buildings.

These policy initiatives have come to be known as “smart growth”. Your state or community may have such “smart growth” programs. “Smart growth” programs have produced an arsenal of tools to accomplish their goals. These have included:

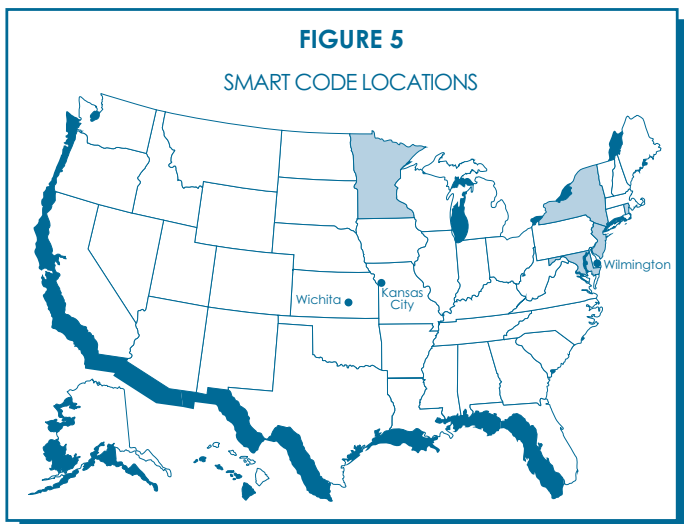
- Zoning that encourages urban infill and reuse of sites and buildings.
- Enterprise zones that attract investment to inner cities.
- “Brown-fields” development that provides for the reuse of abandoned industrial sites.
- Mass transit and transportation planning.
- “Smart codes”.



Source: National Association of Home Builders, 1998.

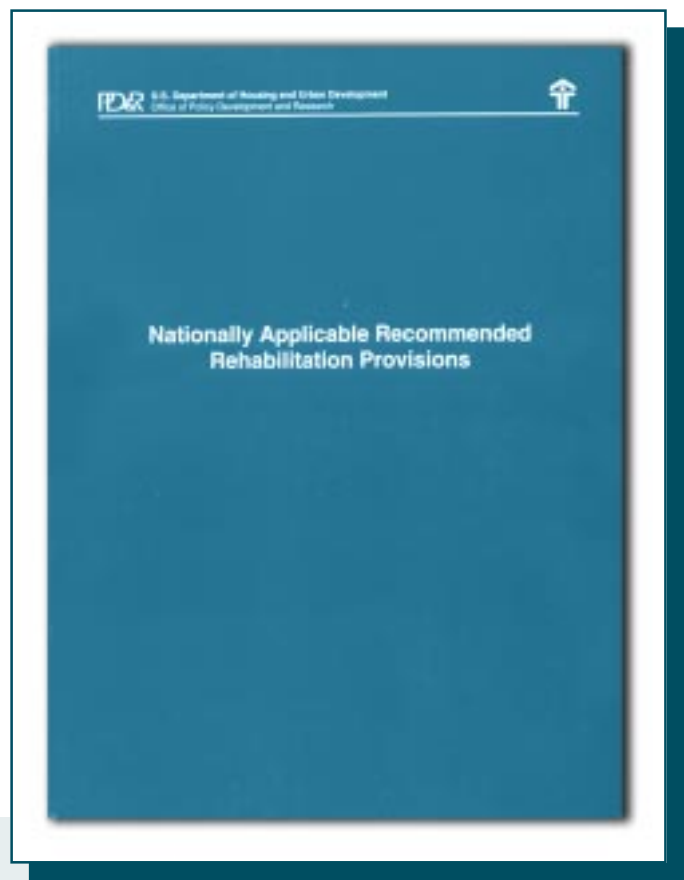
“Smart codes” is the term used to describe building and construction codes that encourage the alteration and reuse of existing buildings. It sometimes also refers to the other zoning and regulatory statutes that affect building, but for the sake of clarity this document discusses building codes only. “Smart codes” were developed because the building regulatory system in the US, including building codes, is a significant impediment to investments in the alteration and reuse of existing buildings.

This has led to a complete re-thinking of how existing buildings should be regulated.



“Smart codes” are being developed with increasing frequency in states and local jurisdictions across the country: New Jersey, Maryland, Minnesota, and Rhode Island, Wilmington, Delaware, Wichita, Kansas and others. Benefits have already been demonstrated in New Jersey. Such codes can improve the rate of reuse of existing buildings in your community, too.

The U.S. Department of Housing and Urban Development (HUD) has recently published a document entitled *Nationally Applicable Recommended Rehabilitation Provisions*. It is referred to as the NARRP, and it is a model for state and local jurisdictions that want to develop “smart codes”. This publication presents the NARRP, and explains how you can use it to develop “smart codes” in your own community.



2 THE CURRENT BUILDING REGULATORY SYSTEM

Overview

There are three categories of regulations that affect buildings in most communities in the “U.S.”

- Zoning regulations, which control land use, and often regulate the types of buildings that can be constructed at particular locations in the community.
- Building codes, which regulate the design and construction of buildings.
- Building maintenance and use codes and regulations, which regulate the use of buildings.

“Smart codes” relate to the latter two categories. To understand them, though, you need some background in how all building regulations work.

What are Building Codes?

Construction codes in a community are generally referred to as “the building code”. They include a complete family of related codes that address different parts or aspects of a building:

- Building code
- Plumbing code
- Mechanical code
- Electrical code
- Specialty codes (boilers and pressure vessels, elevators etc.)

These codes are enforced to regulate health and safety through the issuance of construction permits and inspections. The codes’ objective is to ensure a certain level of safety, health, welfare, and property protection for building occupants and for the general public. To accomplish this, they regulate many aspects of the design and construction of buildings, and of the systems within them. Some states adopt these codes and mandate their use by all jurisdictions in the state, while others leave it up to the local jurisdictions to adopt them.

While some states and jurisdictions have developed their own, most codes currently enforced in the U.S. are based on model codes developed by model code organizations. (See side box.)

There are three model codes generally used in the US:
The *BOCA National Building Code* and related codes were developed and published by the Building Officials and Code Administrators International (BOCA) of Country Club Hills, IL, and if your community is located in the Northeastern part of the U.S. or in the Midwest, it is likely that your codes are based on them.
The *Standard Building Code* and related codes were developed and published by the Southern Building Code Congress International (SBCCI) of Birmingham, AL, and if your community is located in the Southern part of the U.S., it is likely that your codes are based on them.
The *Uniform Building Code* and related codes were developed and published by the International Conference of Building Officials (ICBO) of Whittier, CA, and if your community is located in the Western part of the U.S. or in Indiana or Minnesota, it is likely that your codes are based on them.

Recently, the three model code organizations have gotten together to develop a single set of model codes, first published in the year 2000, and referred to as the *International Codes: International Building Code International Plumbing Code, International Mechanical Code, and others*.

Still more recently, the National Fire Protection Association (NFPA) has begun to develop its own model building code, designated NFPA 5000.

All building codes, refer to standards that control the quality of materials and the designs of systems used in buildings, the loads that building elements must resist, and other aspects of building design and construction.

These standards are developed by a wide variety of organizations that have technical expertise in each subject.

The model codes, as well as the standards they reference, are modified and updated from time to time, depending on new materials, new technology, and improved information on building failures due to various causes such as natural disasters, environmental effects and normal wear and tear. In addition to technical updates these modifications sometimes reflect shifts in priorities for public spending.

While traditionally the requirements in the codes were intended to meet goals of health, safety, welfare and property protection, they have been expanded in recent years to include other societal goals. Some of these goals are:

- Energy conservation
- Accessibility
- Disaster mitigation
- Historic preservation
- Affordability

One result of the periodic updating and expansion of the codes is that buildings built before the current building codes were enacted are probably not in full compliance. So, communities have had to develop special codes to deal with existing buildings for general safety.

What are Building Maintenance and Use Codes?

For general health and safety, the maintenance and use of existing buildings is regulated by a category of codes and regulations that vary from community to community. While building codes generally describe how a new building should be built, maintenance and use codes describe what needs to be done once people already live and work in a building. They may include some or all of the following:



- Housing code, or property maintenance code
- Fire prevention code
- Health regulations
- Hazard abatement code
- Retroactive regulations

The first three codes regulate the uses of facilities that may be detrimental to health and safety, as well as the maintenance of facilities to continue to provide adequate health and safety. Some parts of these codes cover the same building items covered in the building code (e.g., adequate light and ventilation, adequate dimensions of rooms for habitability, or adequate electrical service and outlets), but often the level of specified performance is lower. Generally speaking, older buildings don't have to perform like new ones.

A hazard abatement code provides the jurisdiction with the authority to condemn or raze an existing building that is an imminent hazard to its occupants or the public at large. If a community has a hazard abatement code, it represents what that community considers to be a minimal acceptable level of building performance. In other words, the community will not allow its buildings to deteriorate below that level.

Retroactive regulations mandate improvements for existing buildings. Usually they apply to a class of buildings, such as high-rise buildings (where retroactive sprinklers or enclosure of open stairways may be required), housing (where retroactive smoke detectors may be required), or unreinforced masonry buildings (where retroactive seismic strengthening may be required). Retroactive regulations vary from one community to the next. They reflect a community's economic development environment and as its political and social needs.

All these building maintenance and use codes can apply to any or all buildings in the community, regardless of whether construction work is going on in them. If some renovation or construction work is planned in an existing building, though, it may be that the building or construction codes (that is, the more stringent codes) apply in your community.

What About Construction Work in Existing Buildings?

HUD's 1998 study entitled *A National Survey of Rehabilitation Enforcement Practices* concluded that the regulation of design and construction in existing buildings in many communities in the US is non-uniform (in that requirements placed on similar projects differ from community to community, and in the same community over time), unpredictable (in that requirements are unknown to building owners in advance), and arbitrary (in that there is no apparent basis for requirements that are imposed).

As was mentioned, building or construction codes generally are oriented to the design and construction of new buildings. For example, of the 35 chapters and nearly 700 pages of the *International Building Code* (IBC) 2000, only Chapter 34 and its 14 pages addresses existing buildings. In many cases this disproportionate consideration of existing buildings forces building owners and builders to rely on the discretion and judgement of the code official. This results in a lack of predictability and in arbitrariness, both of which deter investment in existing buildings.

The model codes classify potential work in existing buildings into four categories:

- Repairs
- Alterations
- Additions
- Change of occupancy

Repairs in existing buildings are usually defined as minor projects with very minimal requirements specified in the code. Additions to existing buildings, both horizontal and vertical, are well-defined, and the code requires that the addition comply with the requirements of the new building code, while requirements applicable to the existing part of the building are minimal.

It is in alterations* and change of occupancy** (see sidebar for definitions and more detailed discussion) where the arbitrariness and lack of predictability shows up the most. An owner of an existing building is likely to invest elsewhere, and leave the building as it is, when faced with this unpredictability and arbitrariness. The result is further deterioration of the building stock, and ultimately, its abandonment.

But recent changes and reforms offer much hope and serve as models for your community. These pioneering codes and code guidelines have been shown to support the rehabilitation and reuse of existing buildings across the country and can serve as a model for your community.

* "Alteration" is defined in the IBC 2000 as "any reconstruction or renovation to an existing structure other than repair or addition". This definition covers a wide range of work, from the addition of plumbing fixtures or electrical circuits to "gut rehab". The code specifies that alterations must comply with the requirements of the code for new construction, and that alterations shall not cause the existing building "to be in violation of any provisions of this code". While these requirements may seem clear and unambiguous, there is, great diversity among communities in the U.S. on how to apply them. Earlier model codes applied a so-called "25-50 percent rule" that related the extent of requirements to the ratio of the cost of the alteration to the value of the existing building. When this ratio exceeded 50 percent, the entire building had to be brought into compliance with the code for new construction. While this requirement was dropped from the model codes in the 1980s, HUD reported in the 1998 study entitled *A National Survey of Rehabilitation Enforcement Practices* that 38 percent of surveyed jurisdictions still use such a trigger, and another 16.4 percent stated that while they do not have such triggers, they are useful rules-of-thumb.

** The building code classifies all buildings into specific categories called occupancy classifications. The adaptive re-use of existing buildings often involves changing from one occupancy classification to another. Earlier model codes promulgated by BOCA, SBCCI and ICBO required that an existing building in which the occupancy classification is changed should be brought into compliance with all provisions of the code for new construction, or with the "intent of the code" for new construction. Section 3405.1 of the IBC 2000 reads as follows:

"No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancy. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new proposed use is less hazardous, based on life and fire risk, than the existing use."

No guidance is provided in the code on how to conduct the implied "life and fire risk" analysis. The result is more diversity among communities as to what requirements apply.

3 EARLIER APPROACHES TO REFORM

Some of the most significant approaches to reform of the building regulatory system applicable to work in existing buildings are summarized below.

Massachusetts

In June 1979 the State of Massachusetts, following a thorough study, deleted its building code sections applicable to existing buildings, and substituted Article 22. Article 22 reformed the regulation of work in existing buildings, and with some changes and re-numbering, it continues in use to this day.

It reduced the arbitrariness that had previously existed in the regulation of existing buildings. Perhaps the most significant innovation of Article 22 is its approach to the requirements for a change of occupancy. This approach is based on a hazard classification of occupancies. Rather than applying building code requirements to all changes of occupancy, requirements are applied only in relation to this hazard classification when the hazard is increased. (See sidebar.)

In general, Article 22 contained the following:

- Definition of a limited number of hazardous conditions that must be eliminated in all existing buildings.
- Classification of all occupancies into one of eight hazard classifications, in increasing degree of hazard.
- Establishment of three levels of required performance for rehabbed buildings as a function of the relative change in hazard classification, ranging from a requirement that the level of performance of an existing building not be reduced, to full compliance with new construction requirements.
- Explicit encouragement of the acceptance of equivalent alternatives whenever compliance with new construction requirements is specified.

The Uniform Code for Building Conservation (UCBC)

The UCBC was first developed by ICBO (see sidebar on page 5) in 1985. It was intended to be a model code for design and construction in existing buildings and to reduce the previously prevalent arbitrariness in the enforcement of the UBC's provisions applicable to existing building. The UCBC has been updated periodically, with the last update occurring in the year 2000, but it has not been widely adopted by states or local jurisdictions.

The UCBC is based on the following principles:

- Work cannot reduce the building's performance below that specified in the building code under which it was built.
- New work must comply with building code requirements.
- Classification of all occupancies into several hazard scales, each one set up in reference to a particular type of hazard, and the specification of particular requirements for the respective hazards, when the hazard classification is increased.

The major innovation of the UCBC over Massachusetts Article 22 was the recognition that hazards in buildings are multi-dimensional, and that they can best be addressed by multiple hazard scales, rather than the single scale used in Massachusetts. (See sidebar.)

The New Jersey Rehabilitation Subcode

The most significant recent reform in the regulation of work in existing buildings happened in New Jersey with the adoption of the *New Jersey Uniform Construction Code—Rehabilitation Subcode* in January 1998. Prior to that, New Jersey enforced an earlier edition of the BOCA code that included the 25-50 percent rule (see sidebar on page 8), and the requirement that in any change of occupancy the building had to be brought up to compliance with the code for new construction. The new subcode was developed because it was recognized that the then current code was constraining the re-use of older buildings in New Jersey.

Three criteria were defined for the new system in New Jersey:

- Timeliness of processing and enforcement (i.e., most projects should be handled routinely rather than as special cases).
- Predictability (i.e., people should know the law applicable to them and be free from arbitrary treatment).
- Reasonableness (i.e., provide a reasonable level of safety without imposing excessive additional costs).

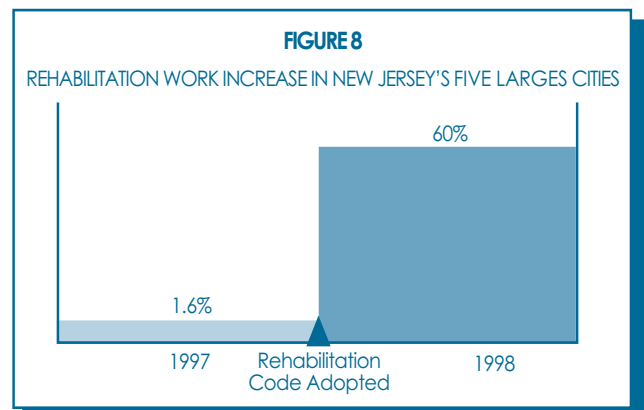
The *Rehabilitation Subcode* that was developed to meet these criteria reflected a true paradigm shift in the regulation of alteration work in existing buildings. It takes the rather broad building code definition of “alteration” (see sidebar on page 8) and splits it up into three well-defined categories of work in progressive increase of complexity:

- Renovation—defined in general as work involving no reconfiguration of spaces in the building.
- Alteration—defined in general as work involving reconfiguration of spaces.
- Reconstruction—defined as work so extensive that the work area cannot be occupied during the work.

Another element of the paradigm shift was the creation and definition of the term “work area”. Both innovations go a long way toward achieving predictability and reasonableness. Progressively more complex rehabilitation work entails progressively more extensive additional required life safety improvements. Reasonableness is achieved by establishing proportionality between the voluntary work proposed by the owner and the additional work imposed by the regulatory system.

The *Rehabilitation Subcode*'s approach to change of occupancy in an existing building parallels that of the UCBC. Multiple hazard scales are established, and a change of occupancy that involves an increase in hazard on one or more of the scales triggers specific additional requirements to address the added hazard.

The *Rehabilitation Subcode* has been in place in New Jersey for about two years, and it is serving its purpose. The State reports that investment in building rehabilitation in cities such as Trenton, Newark and Elizabeth has increased substantially in the past two years due to the new code. (See figure 8.)



4 WHAT IS THE NARRP?

Introduction

HUD published the *Nationally Applicable Recommended Rehabilitation Provisions*, or NARRP, in May 1997.

The NARRP set out to adapt the innovations and principles of the *New Jersey Rehabilitation Subcode* into a model rehabilitation code that could be used by other states and local jurisdictions.

The purpose of the NARRP was succinctly stated as follows:

“The purpose of the NARRP is to set forth a regulatory framework that will encourage the continued use or re-use of legally existing buildings through a predictable system of requirements that will maintain or improve public health, safety and welfare. The intention is to clarify the requirements that apply when different types of work are performed in existing buildings, and to establish proportionality between the work an owner of an existing building intends to do on a voluntary basis and the additional improvements required to accompany that work as matter of regulatory policy. A regulatory framework that achieves such proportionality will go far towards ensuring that building rehabilitation work will be both affordable and cost effective.”

There are many similarities between the *New Jersey Rehabilitation Subcode* and the NARRP. The key paradigm shift happened in New Jersey, and the NARRP is beholden to New Jersey in adopting the concepts. The NARRP condensed New Jersey’s three criteria into two: **predictability** and **proportionality**. It achieves predictability and proportionality by borrowing four concepts from New Jersey each of which is discussed briefly below.

- Categories of work
- Work area
- Hazard category scales
- Supplemental requirements

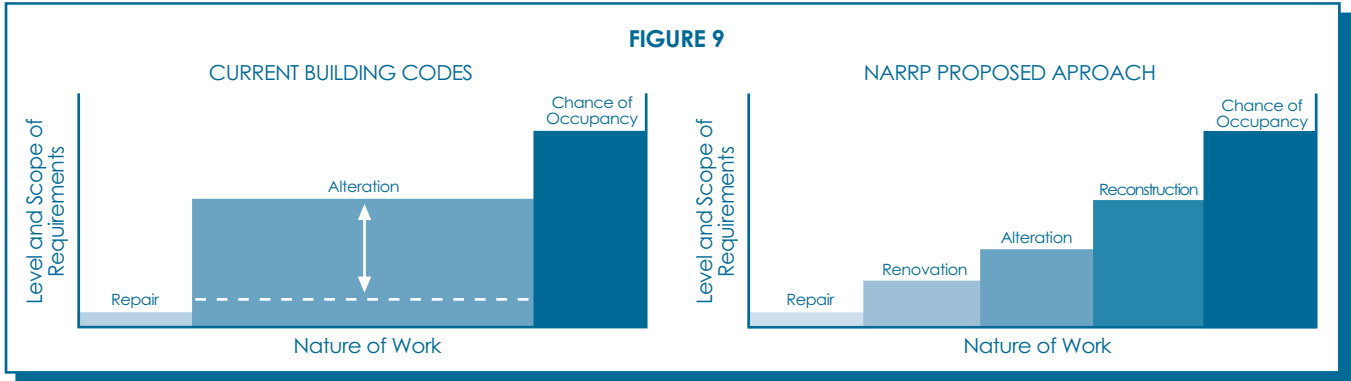
Categories of Work

As previously noted, the model codes currently address work in existing buildings under four categories:

- Repair
- Alteration
- Addition
- Change of occupancy

Following New Jersey, the NARRP expands “alteration” into three further categories, resulting in the following six categories:

- Repair
- Renovation—defined, as in New Jersey, as work involving no reconfiguration of spaces in the building
- Alteration—defined, as in New Jersey, as work involving reconfiguration of spaces or extension of plumbing, mechanical or electrical systems
- Reconstruction—defined, unlike in New Jersey, as work involving reconfiguration of spaces including corridors and exits
- Addition
- Change of occupancy



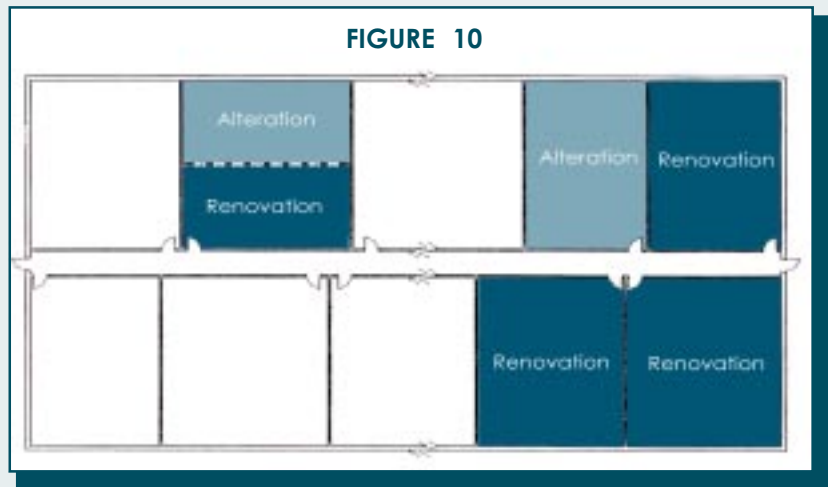
This categorization provides predictability, in that the respective requirements are known at the start. It provides proportionality, in that requirements are proportional to the extent of the intended work. (See figure 9.)

Work in each category is addressed by a separate chapter of the NARRP. The categories of work, including some examples, are discussed in Appendix A.

Work Area

Work area is defined in the NARRP as “that portion of a building affected by any renovation, alteration or reconstruction work as initially intended by the owner...”

The concept of work area provides predictability by specifying exactly where requirements are imposed by the NARRP. It also provides proportionality by its use in defining the applicability of “supplemental requirements” when there is extensive reconstruction.



Supplemental Requirements

Supplemental requirements are triggered in the NARRP when reconstruction work is extensive. When the reconstruction work area exceeds 50 percent of the area of the floor, the NARRP extend some life safety improvements to the entire floor. When the total of reconstruction work areas

in a building exceed 50 percent of the building area, the NARRP extend these life safety improvements to the entire building, up to the highest work area floor. (See sidebar for examples.) The concept of *supplemental requirements* provides predictability by specifying exactly where these additional requirements are imposed by the NARRP. It also provides proportionality by determining the extent of additional life safety improvements.

When doing a reconstruction sprinklers must be installed under certain conditions (e.g., in high rise buildings). Their installation, however, is limited to the work area. If the work area exceeds 50% of the area of the floor on which it is located, the sprinklers must be installed throughout the floor. If the total reconstruction work areas in the building exceed 50% of the building area, the sprinklers must be installed throughout the building up to the highest floor on which there is a work area. A similar example applies to the lighting of exits and to the upgrading of corridor doors and transoms in corridors.

Hazard Category Scales

The NARRP establishes four hazard category scales for classifying building occupancies. In this it differs from the UCBC, which has five, and the *New Jersey Rehabilitation Subcode*, which has six. These differences are not significant.

The NARRP scales are as follows (see Appendix B for a more detailed discussion):

- Life safety and Exits (five hazard categories)
- Heights and Areas (four hazard categories)
- Exposure of Exterior Walls (four hazard categories)
- Seismic (six hazard categories)

The NARRP hazard scales provide predictability by clearly relating specific requirements to specific increased hazards in the existing buildings. (See sidebar for examples.)

The conversion of an office building (Use Group B) to an apartment building (Use Group R-2) may require significant upgrading of life safety and exits in the building, but no height and areas or exterior wall exposure improvements. The latter may be required if the change was to a department store (Use Group M).

Historic Buildings

Chapter 9 of the NARRP, the last chapter, addresses historic buildings. Rehabilitation work in historic buildings is categorized as for other buildings: repair, renovation, alteration, reconstruction, and

change of occupancy. Chapter 9 outlines an optional alternative procedure for regulating historic buildings, and presents a series of exceptions to the requirements of the NARRP that may be applicable in historic buildings. These changes, then, make the requirements for historic building rehabilitation much more clear.

For example, historic buildings in which there is a reconstruction are exempted from most of the improvements of stairway enclosures, stairway railings and exit signs applicable to other buildings.

5 HOW HAS THE NARRP HELPED?

The NARRP were developed by HUD to serve as a model. The Foreword to the NARRP states:

“These provisions are intended to be suitable for use by State and local jurisdictions or model code organizations with a minimum of adaptation.”

The Introduction expands on this:

“[T]he NARRP are being developed for HUD with the expectation that they will be made available to interested state and local government agencies and offered for consideration by the ICC in resolving the rather extensive differences among the three current versions of Chapter 34.”

In the four years since publication, the NARRP have begun to meet the stated intent of serving as a model. The following discussion covers some high points.

UCBC Revision 2000

The UCBC was revised in the year 2000, and its name was changed to *Uniform Code for Existing Buildings* (UCEB). This revision is significant, in that it represented a conscious attempt to include the NARRP's concepts of work area and categorization of rehabilitation work in order to achieve predictability and proportionality. (See sidebar for more detail.)

The UCEB implements the concept of categorization of rehabilitation work (repair, renovation, alteration, reconstruction) without the formal definition of these levels. In other words, the single term “alteration” was retained. What is lost by comparison to the NARRP is the clarity and transparency of the different levels of work. What is gained is the retention of terminology that code enforcement personnel are familiar with. It was felt that jurisdictions used to enforcing the ICBO Uniform codes would feel more comfortable with UCEB than with the NARRP.

The UCEB 2000 was approved by the ICBO membership in September 1999 and was published in early 2001. The State of Minnesota, an ICBO jurisdiction, has recently adopted the UCEB 2000, with some local revisions. This action was the result of an initiative of the State legislature, and it followed a presentation, supported by HUD, of both the NARRP and the UCEB.

IEBC Drafting Committee

In late 1999, the International Codes Council (ICC) created a drafting committee for a new code to be called the *International Existing Building Code* (IEBC). Among other resource documents, the drafting committee is considering both the *New Jersey Rehabilitation Subcode* and the NARRP. For this purpose, the NARRP was revised to be compatible with terminology and requirements of the IBC. HUD has supported this effort.

NFPA Building Code

In late 1999 the National Fire Protection Association (NFPA), an internationally recognized consensus standards organization active primarily in the fields of fire and life safety, undertook the development of a model building code. It is to be called NFPA 5000, and is intended as an alternative to the IBC. NFPA has accepted a proposal to develop a section on existing buildings based on the NARRP, and work in this direction is in progress. HUD has supported this effort, too.

Maryland Building Rehabilitation Code (MBRC)

In 1999 the Governor of Maryland initiated a policy of “smart growth/smart codes”. The State opted to use the NARRP as the basis for developing a new *Maryland Building Rehabilitation Code (MBRC)*. It then initiated intense activity that resulted in the publication of the new code in the Code of Maryland Regulations in December 2000. The MBRC took effect on June 1, 2001. This activity was developed in four phases that are described in Appendix C.



Wichita Rehabilitation Code

In the middle of the year 2000 the city of Wichita, Kansas, began to explore the need to adopt a rehabilitation code. Wichita sought support from HUD, which, in turn, provided a one-day presentation and seminar on the NARRP and the UCEB. The presentation and seminar were conducted with city officials and a committee of stakeholders convened by the City Manager.

Wichita is an ICBO jurisdiction that had adopted the UCBC 1994. Following the presentation and seminar, Wichita decided to develop a rehabilitation code based on the UCEB 2000, while ensuring that all the NARRP concepts of predictability and proportionality were not lost.

The development of the Wichita Rehabilitation Code began with a side-by-side comparison of each provision of the UCEB with provisions of the NARRP and all applicable Wichita and Kansas regulations that impact on existing buildings. The comparative analysis displayed some situations in the UCEB in which lower levels of rehabilitation unintentionally triggered supplemental requirements. This was a direct result of the abandonment of the NARRP definitions of levels of work. As a result, Wichita revised the UCEB, while maintaining its overall organization.

Other Rehabilitation Codes under Development

As of this publication, the following jurisdictions have undertaken the development of a rehabilitation code, or are considering such an undertaking:

- State of New York
- State of Rhode Island
- Kansas City, MO

6 CONCLUSION: WHAT CAN YOU DO NOW?

If you are concerned about “smart growth”, if there is a stock of under-utilized older buildings in your community, and if you have reason to believe that the building regulatory system in your community is contributing to the under-investment in these buildings, you should consider the development of a “smart code”, a rehabilitation code based on the NARRP.

Here are some specific steps you should take:

- 1. Stakeholders committee**—Create a committee of stakeholders who think this might be a problem, and who want to do something about it. Be sure to include potential critics or opponents of a rehabilitation code. The committee should include building officials, fire officials, housing advocates, private sector building owners or the associations representing them, historic preservationists, accessibility advocates, architects and engineers, contractors, environmentalists, etc. The committee should articulate the problems that exist with the current regulatory approach relative to existing buildings, and the objectives of a new “smart code”.
- 2. Exploration of options**—Review all of the different options and models that exist, including HUD’s publications on building rehabilitation codes. Familiarize yourself with these so that you know which options suit your community best, and which are most feasible politically. Request that HUD provide your stakeholders committee with an expert presentation on the NARRP, the UCEB, the New Jersey *Rehabilitation Subcode*, and other related initiatives. Following the presentation there should be an open discussion of options available to you. These may include anything from the development of legislation and the drafting of a rehabilitation code (as in Maryland) to a decision to wait for the development of the *International Existing Building Code* or *NFPA 5000* and to adopt one of them when it becomes available.
- 3. Comparative analysis**—If you make the decision to move forward with the development of a rehabilitation code, then you should initiate a study that involves detailed comparison of the provisions of the NARRP (or the UCEB, or the New Jersey code) with all current regulations in your State and community that may have impact on existing buildings. Such a study will lay the groundwork for the orderly development of the rehabilitation code that will mesh with the current regulatory system. Be sure to include your local building department and/or redevelopment agency in this analysis as well as inform the city council or relevant legislative bodies that you are considering various options. Have information on these options ready to present to any concerned citizens or public officials.
- 4. Develop or adopt a rehabilitation code**—Use the comparative analysis study as the basis for development of your rehabilitation code. The stakeholders committee, or a similar body, should be involved in this process. Enlist the support of these stakeholders so that the process by which you propose code changes becomes easier and more productive.
- 5. Establish follow-up mechanisms**—Consider developing the following activities to ensure the effectiveness of your new rehabilitation code:
 - Developing a training curriculum and program intended for code enforcement officials, architects and engineers, and others who will use the new code.
 - Creating an administrative body responsible for periodically reviewing and updating your rehabilitation code, including the option of adopting the *International Existing Building Code* or the *NFPA 5000* when they become available.

- Performing an evaluation of the code's success (i.e., testing to see whether more existing buildings are being rehabilitated and reused since the adoption) to gauge whether changes are needed.
- Spreading the word about your code adoption and of its use to other municipalities, to other groups interested in existing building rehabilitation, and to government agencies like HUD.

With the steps presented here and the information provided in this and other HUD publications about existing building rehabilitation (see sidebar), you now have the tools to consider advocating and developing a “smart code” in your own community. The benefits of the code for local builders, for housing and commercial developers of all kinds and for all target audiences, and for the maintenance and physical development of your whole community are clear. By drafting guides and model codes, HUD and the model code groups are making the adoption of the codes easier, too. As with all changes in local regulations and with local community interests, though, the first steps lie with interested citizens and governments like you.

HUD has been interested in building codes in general, and building rehabilitation codes in particular, for several years. In addition to codes, we also provide a variety of design and technology tools to help you with rehabilitation work. For a sample of this work, please visit the HUDUSER webpage <http://www.huduser.org> or call the HUDUSER toll-free number located in the frontcover to obtain copies of the following research reports:

- Guideline on Fire Ratings of Archaic Materials and Assemblies, February 2000
- HUD Rehabilitation Energy Guidelines for One-to-Four Family Dwellings, November 1996
- HUD Rehabilitation Energy Guidelines for Multi-Family Dwellings, September 1996
- Innovative Rehabilitation Provisions: A Demonstration of the Nationally Applicable Recommended Rehabilitation Provisions, March 1999
- Innovative Rehabilitation Technologies: State of the Art Overview, February 1996
- National Survey of Rehabilitation Enforcement Practices, June 1998
- Nationally Applicable Recommended Rehabilitation Provisions (the NARRP), May 1997
- The Rehab Guides Volumes 1-9 (Foundations, Exterior Walls, Roofs, Windows and Doors, Partitions, Ceilings, Floors, and Stairs, Kitchens and Baths, Electrical/Electronics, HVAC/ Plumbing, Site Work), June 1997-August 2000
- Residential Rehabilitation Inspection Guide, February 2000
- Residential Remodeling and Universal Design, May 1996
- The Status of Regulations for Housing Rehabilitation, February 1996

APPENDIX A—NARRP CATEGORIES OF WORK

Repair (NARRP Chapter 3) and *renovation* (NARRP Chapter 4) involve no reconfiguration of space. The difference between the two is one of quantity (i.e., and extensive repair becomes a renovation) and the demarking line between them is left to the interpretation of users of the NARRP and ultimately to the code enforcement authority. Under the NARRP, repairs may be done with like materials (with a few specific exceptions), even if those materials are no longer permitted by the building code. Renovations require the use of materials and methods specified in the building code, but not compliance with performance specified in the code. In neither case do the NARRP require work above and beyond that intended by the owner, even when the renovation is to the entire building. There are two exceptions in the case of renovation:

- Some improvements in accessibility may be required, and
- Limited seismic improvements of unreinforced masonry buildings in higher seismic zones may be required if related to the voluntary renovation work.

Voluntary structural strengthening of a building such as seismic or hurricane retrofits, thermal improvement of the building envelope, asbestos and lead-based paint abatement, and similar work, are considered renovation as long as they involve no reconfiguration of spaces. As such, they would entail no additional work beyond the two exceptions noted.

An example of a renovation project in an apartment building is the modernization of kitchens and bathrooms in terms of fixtures and finishes, (without their expansion or spatial reconfiguration) and the upgrading of windows (without the opening of new windows in the exterior wall). Following the NARRP, an owner can carry out such a project throughout the building without having to upgrade the corridors, stairs, exits, fire alarms. Even if the building were a high-rise, the owner would not be required to install sprinklers. Another example is a hotel in which all the finishes are refurbished and bathrooms modernized.

Alteration (NARRP Chapter 5) is work that involves the reconfiguration of spaces other than exits and corridors, the reconfiguration or extension of plumbing, mechanical or electrical systems, or the installation of any new equipment. The NARRP requires all newly constructed or installed building elements to comply with the building code for new construction, with several minor exceptions.

An example of an alteration project is tenant work in an office or apartment building, where many or all the interior partitions are removed and the spaces are reconfigured, but no shared corridors or exits are touched by the work. In this case, an owner must have all new architectural, mechanical, plumbing and electrical work comply with the building code as for a new building, newly created occupied spaces must comply with certain dimensional requirements in the building code, and additional plumbing fixtures and mechanical ventilation may be required. No upgrading of existing corridor partitions, exits or fire alarms, nor installation of sprinklers is required, unless the alteration work is extensive (i.e., "gut rehab"). "Extensive alteration" is defined in the NARRP as reconfiguration of space of over 50% of the total building area, or of an entire occupancy classification within the building.

Reconstruction (NARRP Chapter 6) is work that involves the reconfiguration of spaces that includes exits and corridors shared by more than one tenant, extensive alteration work ("gut rehab"), or renovation and/or alteration when the work area is not permitted to be occupied for reasons of life safety. This definition of reconstruction differs from New Jersey's where the reconfiguration of exits and corridors is considered an alteration. In addition to complying with the requirements for renovation and alteration, reconstruction triggers a specified list of life safety and certain other improvements. These improvements, for the most part, are limited to the work area intended by the building owner. The NARRP include some "supplemental requirements" that apply beyond the limits of the work area. The specified life safety improvements generally reference building code requirements for new construction, but in many cases they are less than those requirements.

Addition (NARRP Chapter 8) is work that expands the existing building vertically or horizontally. The addition must comply with the requirements of the building code for new construction. Few if any requirements apply to the existing portions of the building.

Change of occupancy (NARRP Chapter 7) includes both changes in the character of use and changes in occupancy classifications as defined in the building code. The NARRP, like New Jersey, adopt the concept of classifying occupancies into hazard category scales from the UCBC. The scales govern the extent of applicable requirements. A change of occupancy to an equal or lower hazard rating in any one scale is generally treated like a reconstruction throughout the portion or building undergoing the change. A change to a higher hazard rating on a particular scale triggers compliance with some additional requirements specifically related to the respective hazard.

APPENDIX B—NARRP HAZARD INDICES

Life Safety and Exits—This scale defines five categories of hazard. The ranking is based on the travel distances permitted for the various occupancy classifications in the *BOCA National Building Code*, and further refined by consideration of the anticipated characteristics of the occupants such as density, familiarity with the surroundings and other characteristics that could impact on evacuation time such as being awake or asleep, age and potential impairments.

TABLE A
HAZARD CATEGORIES AND CLASSIFICATIONS: LIFE SAFETY AND E

| RELATIVE HAZARD | USE CLASSIFICATION |
|--------------------|------------------------|
| 1 (Highest Hazard) | H |
| 2 | I-2, I-3 |
| 3 | A, E, I-1, M, R-1, R-2 |
| 4 | B, F-1, R-3, R-4, S-1 |
| 5 (Lowest Hazard) | F-2, S-2, U |

Heights and Areas—This scale defines four categories of hazard. The ranking is based on the allowable heights and areas in the *BOCA National Building Code* (for Type 2A construction).

TABLE B
HAZARD CATEGORIES AND CLASSIFICATIONS: HEIGHTS AND AREAS

| RELATIVE HAZARD | USE CLASSIFICATION |
|--------------------|---------------------------------|
| 1 (Highest Hazard) | A-2, H, I-3 |
| 2 | A-1, A-3, A-4, E, I-1, I-2, S-1 |
| 3 | B, F-1, M, R |
| 4 (Lowest Hazard) | F-2, S-2, U |

Exposure of Exterior Walls— This scale defines four categories of hazard. The ranking is based on the fire resistance rating requirements for exterior walls in the *BOCA National Building Code* (at a fire separation distance of five feet).

TABLE C
**HAZARD CATEGORIES AND CLASSIFICATIONS:
EXPOSURE OF EXTERIOR WALLS**

| RELATIVE HAZARD | USE CLASSIFICATION |
|--------------------|--------------------|
| 1 (Highest Hazard) | H |
| 2 | F-1, M, S-1 |
| 3 | A, B, E, I, R |
| 4 (Lowest Hazard) | F-2, S-2, U |

Seismic—This scale defines six categories of hazard. The ranking is based on a combination of the NEHRP Seismic Hazard Exposure Groups included in the *BOCA National Building Code* and the hazard classifications in the UCBC.

TABLE D
SEISMIC HAZARD CATEGORIES

| RELATIVE HAZARD | USE CLASSIFICATION |
|--------------------|--|
| 1 (Highest Hazard) | H-1, H-4 with highly toxic materials I-2 (hospitals) B (fire, rescue, and police stations) B (emergency preparedness centers) B (primary communication facilities) S (post-earthquake recovery vehicle garages) F (power-generating stations and other utility facilities required for emergency backup) |
| 2 | A, E, I-1, I-2 (all others), I-3, H-2, H-3 F (power-generating stations and other public utilities not listed in Relative Hazard 1) B (used for adult education with an occupant load > 500) Any building with an occupant load > 5000 |
| 3 | R-1, R-2 |
| 4 | F-1, S-1, H-4 |
| 5 | B (all others), F-2, M (all others), S-2 |
| 6 (Lowest Hazard) | R-3, U |

The discussion of each hazard scale points out a specific relationship with the *BOCA National Building Code*. This is because the development of a model rehabilitation code, such as the NARRP, must have a frame of reference and the NARRP's frame of reference is the *BOCA National Building Code*. Similarly, the UCBC's frame of reference is the *Uniform Building Code*. The three model building codes, while similar in many respects, have some differences in specific requirements. These differences would likely result in some differences between occupancy classification hazard scales developed from the respective model codes. (In part this explains the differences between the hazard scales in the NARRP and the UCBC.) This suggests that if the NARRP is adapted to the frame of reference of the *International Building Code*, some adjustments of the hazard category tables will be required.

The MBRC was developed in four phases

Phase 1—Development of Legislation and Draft Code—An Advisory Committee consisting of representatives of all the principal stakeholders (building officials, fire officials, private sector building owners, historic preservationists, accessibility advocates, architects and engineers, contractors, environmentalists, etc.) was created. The Advisory Committee initiated a study that performed a side-by-side comparison of each provision of the NARRP and all Maryland regulations that impact on existing buildings. HUD supported the performance of the study. As a result of this study, revisions were proposed to both the NARRP and to select Maryland regulations. There were two products of this phase. The first was the passage of legislation that:

- Mandated the development of a MBRC based on the NARRP,
- Explicitly defined the NARRP categories of rehabilitation work, and
- Established an Advisory Council to develop and maintain the code.

The second product was a draft MBRC that consisted of specific revisions and modifications to the NARRP.

Phase 2—Development of the MBRC for Publication—The MBRC Advisory Council conducted a series of meetings at which the draft code was further revised. Many issues were addressed and resolved before the Advisory Council in an intense period of about four months.

The MBRC differs from the NARRP in many details. However, its overall structure, and the clarity and transparency with which it reflects the two objectives of predictability and proportionality, are identical to the NARRP. The NARRP served Maryland well as a model code. It provided the rigorous framework within which intense disagreements could be defined and, ultimately, resolved.

Phase 3—Development of the MBRC Curriculum—The Maryland Department of Housing and Community Development developed a curriculum for the training of public officials, architects, engineers, builders and owners in the use of the MBRC.

Phase 4—MBRC Training Program—The Maryland Department of Housing and Community Development conducted a series of one-day training workshops throughout the state. The MBRC curriculum was the basis for this training.

