National Conference of States on Building Codes and Standards, Inc.

May 24, 2005

Dear Colleague:

The members and staff of the National Conference of States on Building Codes and Standards (NCSBCS) are pleased to provide you with the accompanying Final Report on the "NCSBCS/Alliance Survey on Savings from the Application of Information Technology to Building Codes Administration and Enforcement Processes."

NCSBCS, with funding support from the Institute for Building Technology and Safety (IBTS), undertook this survey to help state and local governments enhance the effectiveness and efficiency of their codes administration programs. The survey and the final report address a need repeatedly expressed by jurisdictions for a source of data on the costs, savings, and benefits of applying information technology to their building codes enforcement programs.

We appreciate the funding and technical support the Institute has given us, and the input of the 101 jurisdictions that responded to the survey. This report provides data from jurisdictions of all sizes. It provides a number of survey findings that can assist state and local governments in determining whether or not they should apply I.T. to their programs.

Thanks also to jurisdictions that responded to the survey and offered to be listed as contacts for their colleagues in other states, counties, cities, and towns.

Should you desire additional information regarding the survey or other tools that help jurisdictions enhance the effectiveness and efficiency of their codes administration and enforcement programs, please contact Carolyn Fitch (cfitch@ncsbcs.org or 703 437-0100 ext. 238) or visit our website at www.ncsbcs.org.

We trust you will find this report helpful in carrying out your building code and public safety responsibilities.

Sincerely,

Robert C. Wible
NCSBCS Executive Director & Project Director

National Conference of States on Building Codes and Standards, Inc.

Final Report

NCSBCS/Alliance Survey
on Savings from the Application of
Information Technology to Building Codes
Administration and Enforcement Processes

February – April 2005

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NCSBCS MISSION STATEMENT

NCSBCS serves as a forum in the interchange of information and provides technical services, education and training to our members to enhance the public's social and economic well being through safe, durable, affordable, accessible and efficient buildings.

**Final Report on the NCSBCS/Alliance Survey on
Savings from the Application of Information Technology
to Building Codes Administration & Enforcement Processes
Spring 2005**

I.   INTRODUCTION

New construction and renovation are vital components of our nation's economy and critical to ensuring the welfare and safety of the American public. In this time of both heightened security cautions and increased new construction and renovation, building departments are faced with an increased workload, daunting new challenges, while meeting a raised expectation in the public and private sector for timely service.

Faced with such pressures with diminishing budgets and staff shortage, building departments have increasingly turned to information technology as a tool to make their programs more efficient and effective. A growing number of building departments have successfully reviewed their existing program operations and applied information technology to one or more of their codes administration and enforcement processes. These processes include online permit processing, electronic plan submittals, plan tracking and review, licensing and the scheduling of field inspections. In some cases, savings that have been achieved have cut in half the amount of time it takes for government and the private sector to complete a regulatory process.

Unfortunately, there has been little documentation of such savings for jurisdictions to review when considering information technology for their own programs. In the winter of 2004-2005, the National Conference of States on Building Codes and Standards, with funding from the Institute for Building Technology and Safety and support from members of the Alliance for Building Regulatory Reform in the Digital Age, developed a survey to acquire such information.[①]

This report shares with elected officials, building officials and other interested parties the results of that survey. Conducted nationwide between early February and mid-March 2005, 101 jurisdictions responded to the survey. Fifty jurisdictions of all sizes provided varying amounts of cost and savings data. The remaining jurisdictions provided information regarding either basic benefits of applying I.T. or the barriers that their jurisdiction encountered when they tried to apply I.T. to their building regulatory program.

This report serves as a resource to state and local governments documenting both the costs and the savings that have been experienced. The report also identifies some of the steps that were taken in applying information technology to one or more codes administration and enforcement processes.

[①] See page 17 for more information about these organizations.

II.   EXECUTIVE SUMMARY

In a series of summits and national forums conducted over the past four years, the National Conference of States on Building Codes and Standards and its partners in the Alliance for Building Regulatory Reform in the Digital Age identified barriers to applying I.T. to codes administration programs, which can increase their efficiency and effectiveness. One of the barriers has been the near-total lack of reliable data on the costs of applying I.T. and the savings communities are achieving through its application.

The purpose of the survey described in this report was to acquire and provide state and local governments with such data. The survey was designed with input from a number of jurisdictions that have already acquired and made effective use of information technology in one or more of their building codes and administrative processes. The questions selected were framed to capture actual data on cost and savings or estimated data on the use of information technology if actual data was not available.

The concept of the survey emerged as one of the recommendations coming out of the Alliance's Second Summit on Streamlining the Building Regulatory Process Through Interoperability held in September 2004 in Fairfax County, Virginia.

NCSBCS, with funding from Alliance partner, the Institute for Building Technology and Safety, organized a draft survey work group comprised of code enforcement officials and their information technology staff from building departments that had successfully applied I.T. to one or more of their codes administration and enforcement processes. In addition, NCSBCS field-tested the survey with several other jurisdictions to assure that the format of the survey was readily understood and would draw out available data on both the costs of acquiring and applying information technology and the savings achieved by that application in responding communities. The survey was also designed to capture input from those communities not using I.T. as to what barriers they encountered in trying to acquire or develop I.T. for application to their codes administration and enforcement programs.

After refining the survey, on February 14, 2005, the survey was released to over 5,000 jurisdictions nationwide, including several state building officials' organizations and jurisdictions already in the Alliance's database of code enforcement communities using I.T.

The survey closed in early March. In mid-March, NCSBCS had received and compiled survey responses from 101 local or state building departments. Jurisdictions responding to the survey provided an excellent cross-section of the nation both geographically and by jurisdiction size. Large jurisdictions included New York City, Los Angeles and Chicago. Mid-sized cities included Portland, OR; Louisville, KY; and Richmond, VA. Smaller-sized communities included Cobleskill, NY; Forsyth County, GA; and Morehead City, NC. States providing data included agencies in California, Florida, Iowa, Kentucky, Maryland, North Carolina, Ohio, Oregon, Tennessee, Texas, Virginia, Washington, and Wisconsin.

Out of the 101 jurisdictions that responded:

- 70 reported their use of information technology in one or more codes administration and enforcement process
- 50 jurisdictions provided some cost benefit return on investment information in their response

- 38 of those jurisdictions provided extensive cost/savings data

Examples of types of savings are:

- Cobleskill, NY, (populations 4,533) reduced the amount of staff time it takes to do a building permit from 1 hour to 15 minutes by using I.T.

- Clay County, FL, (population 140,814) applied I.T. to its inspection scheduling and was able to cut by half the number of staff necessary to perform that function and reduce by 75% the amount of time customers had to wait for inspections.

- Chicago's (population 2,846,000) online permit submittals and processing enabled customers to reduce the amount of time it took staff to process a package of building permits for commercial structures from 8 hours to 2.5 hours.

- Los Angeles (population 3,641,000) applied I.T. to 8 codes administration and enforcement processes and as a result, was able to handle an 88% increase in construction activity with a 1.5% increase in staff and a significant reduction in customer wait and processing times.

- Ohio's Department of Commerce applied I.T. to 6 codes administration and enforcement processes. The agency reduced the time to perform inspection scheduling and conducting inspections on an average from 2 hours to 1 hour.

Jurisdictions responding to the survey that used I.T. identified the following items as the most important benefits to the application of I.T. to their codes administration and enforcement programs:

- enhanced their working relationship with their clients (builders, contractors, public)
- enabled them to offer services 24/7/365
- enabled them to share critical data with other agencies
- enabled the jurisdiction to better prepare for, respond to, and recover from disasters.

Several jurisdictions provided direct return on investment statements. For example, Ventura County, CA, noted that for their investment of $160,000 for a permits and inspections software package, the County had saved over $1,000,000 in costs and reduced staff by 3 people while their workload increased by 80% over a 6-year period.

Jurisdictions responding that had not applied I.T. to one or more of the codes administration and enforcement processes overwhelmingly identified the lack of adequate funding as the major barrier to their acquiring and using I.T. The second largest barrier was a lack of time and information to adequately review their existing regulatory system and ascertain whether the application of information technology would be helpful to them.

Many jurisdictions responding to the survey noted that they were in their second or third generation of software for various administrative or regulatory functions.

Fifty-three out of the 70 jurisdictions that reported they were using information technology noted they would be pleased to share their data, information or experience with other communities.

While the survey did not ask jurisdictions what software they used, in follow-up phone calls, some noted a wide-range of vendors. The follow-up calls also revealed that approximately 50% of the jurisdictions using I.T. were still developing software in-house. Many of them, however, noted that if the I.T. industry produced software that was truly interoperable, then they would consider ceasing in-house production.

Not surprising to those running the survey was the fact that few jurisdictions have been able to keep records and extensively document the costs in acquiring (or developing), training users, and maintaining the software. The survey acquired such data documenting for the first time the savings in both time and manpower being achieved. It is important to note that those savings were achieved across the board regardless of the size or geographic location of the jurisdiction. This is an important fact for countless small-sized jurisdictions which have always assumed only large jurisdictions could afford I.T. Moreover, the survey resulted in a sample calculation of Return on Investment for the online permit process for three jurisdictions. Those calculations noted that payback on investment occurred within four months.

Outcome & Next Steps

Heretofore, most information on savings from the application of information technology to the building codes administration and/or enforcement processes was largely anecdotal. While NCSBCS and the Alliance had compiled several case studies of such savings and included them in their "Business Case for Regulatory Streamlining" report, no one had surveyed and compiled this data from a broad cross-section of the nation.

The survey also documents the fact that jurisdictions are sharing data they are acquiring through information technology with their colleagues in other state or local government agencies. In addition, it records for the first time the fact that jurisdictions are making use of I.T. to assist them in planning and preparing for, responding to, and recovering from manmade and natural disasters.

The survey and this final report provide state and local elected officials, building officials and information technology program administrators not only accurate cost/benefit data, but more importantly access to their colleagues who have provided that data.[1]

In addition, information from this survey will be incorporated in several other NCSBCS and Alliance work products including a "Guide on How to Streamline the Building Regulatory Process Through the Use of Information Technology" that NCSBCS is currently writing under funding from the U. S. Department of Housing and Urban Development. Additional information on this and other NCSBCS and Alliance projects are found on the NCSBCS website or by contacting Carolyn Fitch (cfitch@ncsbcs.org or 703 437-0100 ext. 238).

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[1] See Attachment D for contacts in jurisdictions using I.T. This information will be incorporated in the "Listing of Jurisdictions Using Technology" on the Alliance portion of the NCSBCS website at www.ncsbcs.org. Other information available on that site includes discussions on funding, the importance of jurisdictions retaining ownership of their data, and model procurement guidelines.

III.   SURVEY STRUCTURE & APPROACH

As noted in the Introduction, the objective of this survey was to acquire and provide state and local governments with reliable data regarding the costs of and savings achieved from the use of information technology in one or more building codes administration and enforcement processes.

To meet that objective, the authors:

1. Designed an instrument that both acquires meaningful return on investment data regarding the acquisition and use of I.T. and did so in a format that includes building departments that are hard pressed for time.

2. Acquired the data quickly and from as wide a cross-section of the country as possible.

The Alliance for Building Regulatory Reform in the Digital Age and NCSBCS were aided in the preparation of this survey by the fact that they had addressed similar needs in the summer of 2004. With funding from the American Institute of Architects (AIA), they developed and conducted a survey of state and local governments on the use of information technology in the submission, tracking, and review of building plans.[1]

In preparing this survey, NCSBCS and the Alliance also had the benefit of an outstanding project work team that included I.T. staff of the Institute for Building Technology and Safety (IBTS), and building officials along with their I.T. specialists from Fairfax County, VA; Ventura County, CA; Sunnyvale, CA; Mountain View, CA; Richmond, VA; New York City and the States of California, New York and Oregon.

In early February 2005, NCSBCS submitted a draft survey and asked the above jurisdictions to review it and answer the following five basic questions:

1. Is this survey short enough and is it likely to be completed by a jurisdiction and returned to us within the time frame we have requested?

2. Are we asking the right questions? Should we ask others? Will these questions enable us to capture meaningful data?

3. Should we include a question or note about how construction or permitting volume has changed between the old system and under the new I.T. hardware/software system?

4. Would a sample worksheet be helpful to the person receiving the survey?

5. Is it realistic to ask jurisdictions to share reports or studies on costs and benefits with the Alliance?

The responses received from the reviewing jurisdictions shaped the final survey instrument. Using the recommendations of this group, a sample worksheet was created. The sample worksheet was to be sent along with the survey as a guide. The survey was then tested by

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[1] A summary report on the AIA survey are available on the Alliance portion of the NCSBCS website – www.ncsbcs.org.

being sent to the members of the above work group. They were asked to complete the test and return it. Several jurisdictions did so and the survey was ready for national release.

On February 14, the survey was released to over 5,000 jurisdictions nationwide with a three-week turn around time for completion.

(See Attachment A for the final survey instrument.)

Approach – Who Was Surveyed? – State & Local Building Officials[①]

While it was one thing to design a practical survey instrument, to fulfill the objectives of this project it was also critical that the survey go out to as broad an audience as possible, one that represented large and small jurisdictions at the state and local levels and in diverse parts of the nation.

To achieve that objective, NCSBCS assembled an email list and worked with several statewide associations of building officials to gain access to their members. NCSBCS and the Alliance also sought to publicize the survey both through their members and through national news releases that were issued in January and February announcing the upcoming survey event.

As a result of these efforts, state building officials in California, Florida, New York, Ohio, Oregon, Virginia and Washington provided their members access to the survey through their associations. Several I.T. software firms who are members of the NCSBCS Information Technology Industry Advisory Subcommittee provided access to the survey to their clients and 200 jurisdictions in the Alliance database of jurisdictions using I.T. received the survey. In addition, the survey was posted to the Alliance's portion of the NCSBCS website. In sending out the survey, care was taken to ensure that jurisdictions in every state were approached and that a special outreach effort was made to smaller sized jurisdictions.

Over the initial three-week response period, NCSBCS received 89 completed surveys. A one-week extension brought in 101 completed surveys. In a number of cases, the completed surveys were supplemented by calls from NCSBCS staff to the individual who filled in the survey to either seek clarification of some of the information submitted or seek additional information. (A listing of the jurisdictions responding to the survey is provided in Attachment B.)

[①] The target audience for the survey was state and local building officials. In cases where substantive cost and savings data was submitted, building officials were assisted in their responses by their information technology staff and/or other administrative personnel.

It is interesting to note that had the survey, especially Part II regarding the benefits of IT, been submitted to elected officials for their input, the response numbers to the benefits as identified in Attachment E, might have been slightly different. For example, a much higher number of elected officials responding as opposed to building officials may well have selected "Improved jurisdiction's economic competitiveness with other jurisdictions" as one of the major benefits of applying I.T. to a jurisdiction's codes administration and enforcement program. Only 19 jurisdictions identified this as a major benefit in their responses. However, in some follow-up phone calls with building officials in jurisdictions that did not identify this item, they indicated this "benefit" was indeed important to their elected officials.

IV.   SURVEY FINDINGS

As noted in the Executive Summary, in reviewing all of the 101 responses, there are six major findings from this survey:

- Substantive and documented savings are being achieved in jurisdictions of all sizes.
- Information technology does not need to be expensive.
- I.T. is being applied to a wide-range of administrative and enforcement functions.
- Major benefits from I.T. include sharing data with other agencies and enhances the ability to prepare for, respond to, and recover from disasters.
- Jurisdictions are willing to share their experience with others.
- The greatest barriers to I.T. use are a lack of funding and a lack of understanding and access to reliable information on what I.T. can and cannot do and what to watch for when procuring or producing software.

1. Significant Savings

Jurisdictions of all sizes ranging from Los Angeles, CA (population 3,649,000) to Cobleskill, NY (population 4,533) provided data documenting reductions in processing time from 20% to 80% with the application of information technology to one or more codes administration and enforcement processes. Jurisdictions also reported marked improvements in their relationships with their clients/stakeholders (the construction industry, citizens, and their elected officials).

Attachment C to this report provides a composite summary of the costs and savings that 43 respondents identified. Overall, 50 jurisdictions reported savings from the application of I.T. to one or more processes and 38 provided varying degrees of detailed costs or savings or both.

Typical of such savings are the following examples:

- For large cities, Chicago reduced their permit processing time from 45 minutes to 30 minutes for the city and from an average of 8 hours to 2.5 hours for their clients.
- For a large county, Ventura County, CA, over six years saved $1,000,000 in costs and three staff positions by applying I.T. to their permit issuing and inspection processes during a time in which their workload increased by 80%.
- For a medium city, Louisville, KY, reduced the time it takes to process contractor licensing from 1.5 hours to 30 minutes for the city and from 30 minutes to 20 minutes for the contractor.
- For a medium county, Clackamas County's (OR) online permit process saved the county two staff positions and over $40,000 each year and cut clients time by 70% by making the service available to them 24/7/365.
- For a small town, Cobleskill's (NY) online permit application process reduced the amount of time for the town's employees to perform that function from 1 hour to 15 minutes and for their clients from 3 hours to 1 hour.
- For a small county, Forsyth County, GA, reduced inspection scheduling time from 10 minutes to less than 1 for the jurisdiction with reduced waiting times for their clients.
- State savings varied depending on their degree of regulatory oversight and authority. As noted earlier, Ohio cut in half some administration and enforcement function time frames.

2. I.T. Need Not Be Expensive

The costs for acquisition (or development), training and maintenance of information technology for the responding jurisdictions varied depending upon the size of the jurisdiction and the number of codes administration and enforcement functions to which I.T. had been applied.

In general, the larger jurisdictions tended to have more homegrown programs or made more extensive revisions to off-the-shelf software packages than did smaller jurisdictions. Many jurisdictions noted they were able to reduce the cost of software development or purchase when they first streamlined their process prior to applying I.T. Their two messages: "Do your homework first, then apply I.T." and "Make sure your jurisdiction retains ownership of its data."

General Findings on Costs:

Large to medium cities responding to the survey reported acquisition costs ranging from $4,000,000 in Chicago for a package of both in-house and purchased software covering 7 different codes administration and enforcement functions down to a moderate-sized city of Chula Vista, CA, which paid a total of $38,182 for a software package covering 6 administration and enforcement processes.

A range of costs for very small jurisdictions ran from those of Cobleskill, NY, which purchased a $5,000 permit application package, a $1,000 inspection scheduling package, a $1,000 master plan package, and a $1,000 fire archive index package from a major software vendor to those of Durham, NH, which purchased a software vendors permit application package for $1,800.

As expected, training costs varied with the size of the jurisdiction and number of processes to which I.T. had been applied.

Training costs reported by Phoenix, AZ, were $25,000 for an inspection scheduling system, $80,000 for a plans submission and review package, and $100,000 for a remote inspections program that is being used by 151 inspectors.

Training costs for Cobleskill, NY, a very small jurisdiction, were $10,000 for a permit application process, $2,500 for an inspection scheduling process, $3,000 for a master planning software, and $3,000 for a fire archive index.

Where reported, total ownership costs (maintenance, purchase of accompanying hardware, license agreements, etc.) likewise varied according to the size of the jurisdiction and the number of functions to which they applied software. A number of jurisdictions uniformly cautioned that future long-term cost of their I.T. systems depended upon the jurisdiction retaining ownership of their data.

Small Jurisdictions' Experience with Cost:

In 12 jurisdictions providing cost/savings data with populations of fewer than 25,000, it was uniformly noted that significant savings in time and resources were being achieved with relatively inexpensive software applications to such services as permit applications, inspections and inspection scheduling and contractor licensing. Most of these jurisdictions purchased existing software packages from a wide range of vendors. Most reported that in applying the software to their programs minimal adjustments were necessary to either their operation procedures or to the software.

This finding is encouraging as the Alliance and NCSBCS over the years have heard from many jurisdictions of this size that they were reluctant to apply I.T. to their programs simply because they did not have access to independent (non-vendor) information on costs and savings regarding jurisdictions of their same size. This report provides such data as well as contacts in small jurisdictions that have successfully applied I.T. [①]

Return on Investment:

As noted in the Executive Summary, a number of jurisdictions responding to the survey offered direct return on investment (ROI) statements. Ventura County, CA, and Clackamas County, OR, are two such examples.

Ventura County reported that their investment of $160,000 in a package of software for both permit issuance and inspections saved them over $1,000,000 since 1997, and had been able to reduce staff by three persons while handling an 80% increase in their workload.

Clackamas County spent a total of $235,000 putting in place and maintaining an online permit processing system. They are seeing both $40,000 in annual direct savings, were able to shift two staff positions to other functions, and passed along major savings in time to their clients while handing a major increase in construction volume.

Smaller jurisdictions likewise reported significant returns on their investments. Prince George County, VA, with a population of 28,900 and an investment of $93,700 for their permits and inspection software package, was able to cut in half the amount of time it takes to perform those two functions and shift two staff members over to other functions during a time of increased construction volume. The jurisdiction also reported that this cut the client's time to apply for permits and call for inspections in half. These are savings far above the $93,000 investment.

In addition to the above, nearly every jurisdiction responding noted that even if the application of information technology to a building codes administration or enforcement process cost more money than they were initially saving in time or personnel, the rise in customer satisfaction alone made the application of I.T. a good return on investment.

A discussion on the quantitative determination on Return on Investment is provided in Section V Composite & Detailed Survey Findings – Sample Savings & Return on Investment Analysis and in Attachment F to this report. The technical analysis of the Return on Investment for online permit processing for three sample jurisdictions is provided in Attachment F, which documents a four-month payback period.

[①] For additional discussions on important issues relating to the short-term and long-term costs of software, visit the Alliance portion of the NCSBCS website and the Model Procurement Requirements.

3. I.T. Applications Broad

Out of the 101 respondents, information technology was being used in the following codes administration or regulatory processes:

    63 Permit applications and processing
    36 Plan submittal and processing
    29 Some aspect of plan review
    52 Licensing (either contractor, building official, or both)
    59 Inspection scheduling
    30 Conducting inspections
    29 Other Functions

Of those identifying OTHER administrative or regulatory functions, the most common additional functions mentioned were: document imaging, archiving, general complaint and work flow handling, code violations and enforcement tracking, code change submittals; property maintenance, parcel tracking, GIS, and processing federal mandated reports. Overall, the respondents identified 17 different codes administration and enforcement processes or procedures as having had information technology applied to them.

A number of jurisdictions (e.g. Fairfax County, VA; Los Angeles, CA; and Portland, OR) noted that I.T. was enabling them to link and coordinate various codes administration and enforcement functions with those of other government agencies. Those agencies included zoning & land use departments, fire, police, and tax assessment departments.

Several jurisdictions noted that they likewise were exploring similar data-sharing but were at this time unable to do so either because of lack of funding or because of interoperability issues. These comments paralleled similar findings from two national Summits on Streamlining the Building Regulatory Process Through Interoperability.[①]

4. Major Benefits Include Data Sharing and Disaster Preparation, Response and Recovery

Of the 70 jurisdictions that reported using information technology for one or more codes administration and/or enforcement processes, the following were listed as being the benefits they were deriving from the technology. (Most jurisdictions identified 2 or 3 benefits, however, 8 jurisdictions did not mark up this section of the survey.)

- 55 Improved overall relationship between the jurisdiction and clients (stakeholders)

- 38 Enabled the jurisdiction to share critical data with other agencies enhancing the government's effectiveness and efficiency.

- 37 Enabled the jurisdiction to offer a service 24/7/365.

- 30 Enabled the jurisdiction to better plan for, respond to, and recover from natural and manmade disasters

- 19 Improved jurisdiction's economic competitiveness with other jurisdictions.

[①] See reports on the Alliance portion of the NCSBCS website.

- 25 "Other Benefits" including:
    - 12   Better enforcement
    - 7   Enables staff to work on other required duties with time being saved
    - 3   Allows state to provide greater statewide code uniformity
    - 3   Facilitates completion of complex federal mandates

Of the above benefits, the one that may be worth further study was the relatively strong response received from respondents noting that their I.T. program enabled them to better plan for, respond to, and recover from natural and manmade disasters. The Santa Clara, CA, chief building official noted: "Our GIS, which provides aerial photos and exact location of properties, and our construction drawing for building projects that are scanned and attached to our permit database, will definitely help during emergency disaster events. We are capable of retrieving pertinent information with our computers almost instantly without going through the long searching process of paper files." Given the importance of homeland security, having more input from jurisdictions on how they are using I.T. to strengthen disaster preparedness, response and recovery would be worthwhile.

Lastly, as noted in the previous section, a number of jurisdictions reported during follow-up calls that they would be able to better share codes administrative and enforcement data with other agencies if the hardware and software being used was interoperable (able to be shared regardless of the configuration or the software package in which the data was originally compiled).

5. Jurisdictions Willing to Share Information

Of the 70 jurisdictions using information technology in one or more process, 53 noted that they are willing to be contacted by other jurisdictions and share I.T. information. Three of the 70 jurisdictions went further by noting that they would be willing to share any additional data they had in their offices regarding the costs and savings from the use of information technology in one or more of their processes.

Given the time pressures on building departments these days, 53 out of 70 jurisdictions offering to talk with their colleagues in other jurisdictions is very generous.[1]

6. Greatest Barriers

The 31 jurisdictions that responded by noting they are not currently using information technology in their codes administration and enforcement program, marked the following items as the major barriers to their application of I.T. (Note: Jurisdictions were free to check more than one reason.)

- 29 Lack of funding to support the acquisition and operation of I.T. in their jurisdiction.

- 10 Lack of time to review their existing regulatory system to ascertain whether application of information technology is either needed or helpful.

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[1] See Attachment D for these 53 jurisdictions and their contact points. In addition, NCSBCS is posting these names to the Alliance portion of the NCSBCS website www.ncsbcs.org.

- 9 Do not have access to information/expertise to determine if I.T. would improve codes administration and/or enforcement process.

- 8 Current system works fine as is - no complaints ("if it isn't broke, don't fix it.")

- 4 No demand from customers for such services.

In addition to the above responses from jurisdictions not using I.T., 8 other jurisdictions that do use I.T. (8 out of the 70 so responding), noted that further adoptions or improvements in their current I.T. applications were being held-up by a lack of funding. The most common funding sources for I.T. were either a special surcharge on permits or the general fund.[1]

Several of the 101 jurisdictions responding noted it would be easier to acquire more I.T. if all such software and hardware were truly interoperable, enabling them to better shop for price, acquire the "best of the breed," helping to assure retaining ownership of their own data and not be stuck with having to always go back to the same software provider. In addition, interoperability facilitates the exchange of data with other agencies or neighboring jurisdictions.[2]

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[1] For more information on funding sources, go to the Alliance portion of www.ncsbcs.org.

[2] These comments on the need for interoperable hardware and software parallel the initial findings of the Alliance at their organizational national forum in the summer of 2001. The subject of interoperability subsequently has been the focus of two Alliance national summits (New York City, September 2003 and Fairfax County, VA, in September 2004). The two interoperability summits and the Alliance/NCSBCS/AIA survey are available on the Alliance portion of the NCSBCS website at www.ncsbcs.org. Additional information on interoperability is available from Alliance partner, the International Alliance for Interoperability (IAI), on www.iai-na.org.

The objectives of both of those summits was to bring together the construction industry, building regulatory officials and the information technology industry to enhance effective codes enforcement and reduce the regulatory cost of construction by identifying barriers to and developing an action agenda to promote the development of a "state-of-the-art integrated and interoperable building regulatory system" for the nation. (Such a system would continue to operate at the state and local level.)

In addition to the above, 53 out of the 120 jurisdictions responding to the May 2004 Alliance/NCSBCS/AIA Survey on Electronic Plans Submittals, Tracking, Review Retrieval and Storage, identified the "lack of interoperable hardware/software" as one of the major barriers to greater use of electronic plans submittal programs.

Interoperability is defined as enabling discrete processes to communicate and share common and essential information and functionality throughout the building regulatory process using interchangeable software tools. More simply put, interoperability is the ability to enter data once into one program and have it migrate into other software information programs.

V.   COMPOSITE & DETAILED SURVEY FINDINGS

Part V of this report provides you an overview of the types of jurisdictions responding to the survey, a sample of costs and savings being achieved by three jurisdictions of varying sizes (Los Angeles, CA; Chula Vista, CA; and Cobleskill, NY), and connects you to some of the detailed responses provided and contained in other attachments to the report.

Attachment A is the survey instrument used in this project. Attachments C & E provide both some of the detailed cost/savings responses (Attachment C) and a composite (Attachment E) of the answers by responding jurisdictions to the Part I: A & B, Part II: Benefits, and Part IV: Documentation of Studies Supporting Cost Savings. Those jurisdictions that responded to the survey noting they were willing to be contacted concerning their experience with other jurisdictions (Part IV, Question D) are listed along with the person to contact in Attachment D to this report.

Jurisdictions Responding

Out of the 101 jurisdictions responding: (See Attachment B for a complete list.)

25 were state government agencies

14 were counties of which:
>   1 was a major county (population of 1 million or more)
>   4 were mid-sized counties (populations of 500,000 to 1 million)
>   5 were medium sized (populations of between 100,000 and 500,000)
>   4 were small sized counties (populations below 100,000)

62 were cities, towns or townships of which:
>   13 were major cities (populations of 300,000 and above)
>   14 were medium sized cities (populations of 100,000 to 299,999)
>   15 were small cities (populations between 20,000 and 99,999)
>   20 were towns, townships or boroughs (less than 20,000)

Sample Savings - Three Examples of Local Jurisdictions: Large/Medium/Small

Forty-three jurisdictions completing the survey provided substantial data on costs and/or benefits. These have been compiled and included as Attachment C and E to this report. A sampling of that data is provided on the next page. The sample offers a cross section of the jurisdictions responding and three examples (Los Angeles, CA; Chula Vista, CA; and Cobleskill, NY) of the I.T. costs and savings.

Under Attachment F to this report, a detailed quantitative analysis of the Return on Investment from just the online permit processing for the three sample jurisdictions has been provided. The ROI calculations provided in Attachment F shown that the online permitting process total acquisition and ownership costs are recouped in a little as four months when applied against the savings these jurisdictions make in time and manpower alone. That is a very short "payback period", and does not include any calculations for the intangibles to the jurisdiction of greater client satisfaction or the client's being able to now access permits 24/7/365.

Sample Savings – Three Examples: Large/Medium/Small Local Jurisdictions

Jurisdiction/ IT Area	COSTS			TIME/STAFF PRIOR TO I.T. IN PLACE				TIME/STAFF AFTER I.T. IN PLACE				Difference Construct Volume
			Total	Jurisdiction		Customer		Jurisdiction		Customer		
	Acquisition	Training	Ownership	Time to perform	Manpower	Time to perform	Manpower	Time to perform	Manpower	Time to perform	Manpower	
Los Angeles, CA												
Permit apply	$276,510	$3,000	$33,043	14 min	1	2 hr	1	0	0	10 min	1	Yes
Plans application	$81,600	$8,160	$39,640	1 hr	1	4 hr	1	5 min	1	5 min	1	Yes
Licensing	$52,457	$2,400	$21,931	12 min	1	72 min	1	5 min	1	65 min	1	Yes
Insp sch-IRFIS	$14,895	$0	$20,043	3.5 min	1	3.5 min	1	0	0	3 min	1	Yes
Insp sch-AIRS	$199,170	$6,000	$33,043	3.5 min	1	3.5 min	1	0	0	3.5 min	1	Yes
Insp sch-ICBS	$179,170	$12,000	$33,043	3 min	1	0	0	0	0	0	0	Yes
Conduct inspect	$48,960	$8,160	$63,300	10 days	3	12 days	1	3 days	3	3 days	1	Yes
Code enf-disasterEn	$1,850,000	$13,000	$97,000	10-25 hrs	1	3 min	1	10-25 hrs	0	3 min	1	Yes
Inform util-PPR	$14,695	$0	$12,026	10 min	1	70 min	1	0	0	3 min	1	Yes
Inform util-IPAr	$14,695	$0	$12,026	5 min	1	5 min	1	0	0	2 min	1	Yes
Chula Vista, CA												
Permit apply-proces	$38,182	$10,000	$95,369	3 hrs	1	1.5 hrs	1	30 min	1	30 min	1	Yes
Plan submittal	Incl above	Incl abve	Incl above	1 hr	1	30 min	1	30 min	1	15 min	.5	Yes
Licensing	Incl above	Incl abve	Incl above	1.5 hrs	3	30 min	1	30 min	3	20 min	3	Yes
Inspect scheduling	Incl above	Incl abve	Incl above	30 min	1.5	20 min	1,5	10 min	.5	15 min	.5	Yes
Conduct inspections	Incl above	Incl abve	Incl above	30 min	5	20 min	5	10 min	15	15 min	15	Yes
Gov reports	Incl above	Incl abve	Incl above	6 hrs	1	N/A	N/A	1 hr	1	N/A	N/A	Yes
Cobleskill, NY												
Permit apply	$5,000	$3-5,000	$10,000	1 hr	1	3 hrs	1	15 min	1	1 hr	1	20% incr
Inspect scheduling	$1,000	$1,500	$2,500	30 min	1	N/A	N/A	15 min	1	N/A	N/A	20% incr
Master plan	$1,000	$3,000	$4,000	12 hrs	1	N/A	N/A	1 hr	1	N/A	N/A	No
File archive index	$1,000	$3,000	$4,000	3-6 hrs	1	N/A	N/A	15 min	1	N/A	N/A	No

VI.   NEXT STEPS

The detailed data received from 38 of the 101 jurisdictions responding and included in this report, provides building officials and elected officials, the construction community, and Alliance partners with information substantiating costs and savings by jurisdictions of all sizes in all parts of the country from the careful application of information technology to one or more codes administration and enforcement process.

The next major step is for this report and its data to receive wide national dissemination and for state and local governments across the nation to make use of this information and the contacts in the surveyed cities in making their own decisions as to whether or not to apply I. T. to one or more of their codes administration or enforcement programs.

To that end, the authors of this report are issuing a national press release on the availability of this report and propose taking the following next steps:

1. Add to Alliance and Other Databases to Help Other Jurisdictions

This report and its list of jurisdictions and contacts will be added to the Alliance database which is on the NCSBCS website (www.ncsbcs.org). This is made possible from funding received from the U. S. Department of Energy with the assistance of the National Institute of Standards and Technology (NIST). In addition, NCSBCS will share that data with the U.S. Department of Housing and Urban Development's Regulatory Barriers Clearinghouse Database at www.huduser.org/rbc.

2. Include as Input to Other Streamlining Initiatives

In addition, NCSBCS, under funding from the U. S. Department of Housing and Urban Development, will include basic findings from this survey within the text of a "Guide on How To Streamline the Building Regulatory Process Through the Effective Use of Information Technology." Work has already begun on that publication.

3. Look At/Document How I.T. Enhances Better Preparation for, Response to, and Recovery from Disasters

Homeland security, the protection of our communities and nation from all hazards, natural and manmade, is of increasing importance to all Americans, our private sector and to our elected officials. The significant response from surveyed jurisdictions that they are making use of information technology that is being applied to their current codes administration and enforcement processes to strengthen their ability to plan for, train for, mitigate, respond to, and recover from natural disasters warrants additional study and documentation. Such an initiative could substantiate the value and efficacy of accessing DHS funding to support the jurisdiction's ability to comply by 2007 with a number of the requirements of the newly-mandated National Incident Management System (NIMS) and elements of its Universal Task List.

4. Apply Survey Results and Above Documentation to Obtain Federal Funding Support for Matching Streamlining Grants to State and Local Governments

One last use of this survey is to further document the savings possible to the construction industry and to state and local governments through the application of information technology as a tool to help state and local governments to streamline their building regulator processes through the effective use of information technology.

Pending with the White House Office of Science and Technology Policy is a proposal from the Alliance for Building Regulatory Reform in the Digital Age for matching grants to state and local governments to help them reduce the regulatory cost of construction and improve homeland security through regulatory streamlining.

Closing Comments

THANK YOU! The authors of this report wish to thank each of the building officials and the information technology personnel who took the time to complete and submit their response to the "Survey on Savings from the Application of Information Technology to Building Codes Administration and Enforcement Processes." Sharing your time and expertise has been invaluable.

We thank those building officials who participated in our survey project team and the state building official associations and information technology industry firms that helped us distribute the survey to the broadest possible national audience.

We also wish to thank the Institute for Building Technology and Safety for, not only funding this survey and this final report, but also providing through Greg Lindsay, Manager of Information Systems, professional guidance throughout this project and his input on the ROI calculation in Attachment F.

Lastly we thank you, the building officials, construction industry, and elected officials who day in and day out work to provide quality and effective services to support the oversight of the construction and design of buildings in your state or local community. If you are using I.T. in your programs, we hope that this survey provides you with some useful ideas as to other areas in which this tool can be used to enhance your programs. To those of you who have thus far not applied I.T. to a part of your program, we hope that this report and its contacts provide you with an invaluable tool to help you increase the effectiveness and efficiency of your program.

ABOUT NCSBCS

The National Conference of States on Building Codes and Standards was founded by the nation's governors in 1967 to promote the development of an efficient, cooperative system of building regulations to ensure the health, safety and welfare of the public within the built environment.   NCSBCS provides technical support to the National Governors Association under a 24-year-old executive branch agreement. NCSBCS provides secretariat support to the Association of Major City & County Building Officials (AMCBO) and the Industrialized Buildings Commission, an interstate compact.

Among the services offered by NCSBCS to its members are: monthly important issues call, monthly e-Bulletin on national issues relevant to effective and efficient codes administration and enforcement, and a message board for code administrators. Visit www.ncsbcs.org for more information on membership benefits.

ABOUT IBTS

IBTS is a 501c(3) not-for-profit corporation formed by governmental organizations to reduce the burdens on all levels of government within the built environment. The Institute's multi-disciplined staff of 50 engineers and technicians has expertise in business process re-engineering in support of the building regulatory processes, building plan/peer review, building inspection and Military Housing inspection, auditing, quality assurance, facilities program management, energy, and education and training for building program condition assessments.

IBTS's mission is to serve in the public interest, providing unbiased analyses and recommendations. The Institute was created and is jointly governed by representatives appointed by the National Governors Association (NGA), the Council of State Governments (CSG), the National Association of Counties (NACo), the National League of Cities (NLC), and the National Conference of States on Building Codes and Standards NCSBCS).

ABOUT THE ALLIANCE

The Alliance for Building Regulatory Reform in the Digital Age is a 44 member public-private partnership comprised of associations representing state and local government, the building construction industry, academic institutions and federal agencies. The Alliance was founded in the summer of 2001 to develop programs that help reduce the regulatory cost of construction through the effective use of information technology in the building regulatory process.

The Alliance's mission is to enhance public safety and improve economic competitiveness through the use of information technology to enable the nation's construction industry to build faster, better, safer and at less cost.

Alliance partners include: U. S. Conference of Mayors, National Governors Association, National Association of Counties, American Institute of Architects, American Society of Civil Engineers, National Association of Home Builders, Association of Major City and County Building Officials, International Code Council, Institute for Building Technology and Safety, National Fire Protection Association, and six federal agencies including the National Institute of Standards and Technology, General Services Administration, U. S. Department of Energy, U. S. Department of Housing and Urban Development and the Department of Agriculture's Rural Housing Service. A listing of Alliance partners is attached.

National Conference of States on Building Codes and Standards provides secretariat services to the Alliance. Alliance work products and information can be found on the Alliance portion of the NCSBCS website.

Alliance for Building Regulatory Reform in the Digital Age

Members
American Institute of Architects
Associated General Contractors of America
Association of Major City/County Building Officials
Building Owners & Managers Association International
Civil Engineering Research Foundation (CERF)
Commonwealth of Pennsylvania
Commonwealth of Virginia
Council of State Community Development Agencies
*Design Build Institute of America
Fannie Mae
*Federal Emergency Management Agency
Industrialized Buildings Commission
Institute for Building Technology and Safety
International Alliance for Interoperability
International Code Council
National Association of Counties
National Association of Home Builders
National Conference of States on Building Codes and Standards (NCSBCS)
National Fire Protection Association
National Governors Association
National Institute of Building Sciences
National Institute of Standards and Technology (NIST)
U. S. Conference of Mayors
U. S. Department of Agriculture
U. S. Department of Energy
U.S. Department of Housing and Urban Development (HUD) &
Partnership for Advancing Technology in Housing (PATH) &
*America's Affordable Communities Initiative – Bringing Homes
Within Reach Through Regulatory Reform*
U. S. General Services Administration

Affiliates
American Subcontractors Association
Arizona State University Del E Webb School of Construction's Housing Research Institute
Carnegie Mellon University
City of Milpitas, California
City of San Jose, California
ComCARE Alliance
Council for Excellence in Government
Council of State Governments
Fairfax County, Virginia
FIATECH
*Harvard University's Joint Center for Housing Studies
Massachusetts Institute of Technology
National Association of State Chief Information Officers
National Association of State Facilities Administrators
*National Science Foundation
New York City
Stanford University Center for Integrated Facility Engineering
State of California
State of Maryland
State of Oregon
State of Washington
Virginia Tech Center for Housing Research

*Membership pending