

City of Knoxville

Division of Plans Review and Inspections

Operations Assessment

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Introduction

MTAS was asked to assess the operational effectiveness of the City of Knoxville's Plans Review and Inspections Division. This assessment review will focus on organization and staffing; adopted codes and appeal boards; licensing and fees; operating and permitting procedures; plan review and inspection services; comparison with other cities and the survey reviews. This assessment will include a review of survey results, recommendations, and a summary.

In preparing the assessment MTAS conducted confidential surveys of support staff, inspectors, and plan reviewers within the Plans Review and Inspections Division. Surveys were also conducted for various trade contractors, general and specialty contractors, and architects and engineers performing construction services within the City of Knoxville. MTAS also researched the building code programs of other similar sized cities and reviewed the building code data from the North Carolina Benchmark Program. In addition to the surveys the City of Knoxville's Building Code Administrator, one building inspector, and one plan examiner were interviewed. The Code Administrator provided requested data for the assessment.

Summary of Recommendations:

1. Eliminate the position of Chief Building Official. The present Codes Administrator performs the functions and responsibilities of a Chief Building Official, and the four Chief Inspectors within the division are available for review and consultation relating to specific technical issues and aspects of the various codes. To provide a Chief Building Official would duplicate many of the services already provided by the Codes Administrator and increase operating costs. The City of Nashville's Code Administrator serves as the Chief Building Official.
2. While inspector training may be driven by certification requirements, non-inspector personnel training needs are not. Conduct a staff training assessment and develop or provide training opportunities to meet the needs identified.
3. Properly allocate the costs of plan examiners provided by KUB, the fire department, and the engineer to the division.
4. Establish clear lines of authority and supervision within the codes division for plan examiners funded by other operating budgets.
5. Plan for the eventual replacement of retiring inspectors and plan examiners.

6. Although the current strategy of waiting for revisions in the International Building Code relating to SEISMIC regulations or until the state adopts the code may be a reasonable approach, the City may want to consider adopting the code with the SEISMIC regulations deleted so that architects, engineers, and contractors can use new materials and methods contained in the International Building Code. A structural engineer could advise the City about which SEISMIC regulations to delete and which to retain.
7. Combine the Electrical Board, Plumbing Board, and Mechanical/Gas Board into the Building Board of Adjustments and Appeals Board or combine them into two appeal boards. This should simplify the appeal process and reduce the time needed to resolve issues. Most qualified building code appeal members are also qualified to hear appeals in the other codes. Most contractors, architects, and engineers who serve on appeal boards, to some extent, perform work in electrical, plumbing, mechanical, or gas disciplines.
8. Presently contractors are charged from \$100 to \$200 to appeal a decision of the inspectors. Such fees that discourage appeals, should be refunded when the contractor's appeal is upheld by the appeals board.
9. The City should follow the state contractor's laws in regard to licensing.
10. Require all contractors to register with the City regardless of where licensed so that the City may communicate with the contractor when necessary.
11. Consider using a quarterly newsletter to communicate with registered contractors.
12. The City should develop a division operating procedures manual.
13. The City should complete the development of a one-stop permitting process.
14. The City may want to consider asking the architect, engineer, or contractor if they want to fast-track their project by attending pre-design meetings and pre-construction meetings. Such meetings can minimize many of the issues by making the applicant aware of the design standards and construction

procedures required by the City. The City currently provides pre-design and pre-construction meetings only upon request and the service is not well used. During the plan review process deficiencies may be noted that can be immediately communicated to the architect, engineer, or contractor and save valuable design and construction time.

15. The City should develop a fast track process to advise the owner, architect, engineer, or contractor of deficiencies noted prior to the completion of the review, particularly if the deficiencies are significant. If there is a significant structural problem identified, and the plans examiner has completed his part of the review, why should the customer have to wait until the fire inspection review is completed to learn of the deficiency? In some instances the review process may be up to thirty (30) days.
16. Develop a division operating procedures manual.
17. Require the plans reviewer to use a standard check-list to minimize the need for additional check-lists to be initiated in the field. Provide the field inspector with a set of approved plans and the reviewer check-list for review prior to the inspection.
18. The Inspection Division's mechanical inspectors should routinely review and inspect buildings using the Standard Building Code, which is written and developed to be in compliance with the fire code.
19. The City may want to reconsider its policy on not allowing covered storm water retention facilities and establish a standard period of time for storm water reviews to be completed. The City also may want to consider using local engineering firms to assist in storm water reviews when reviews cannot be accomplished in a reasonable period of time. The City may also want to consider using the 100 year event standard for storm water facility design in some areas of the City instead of using the much stricter 500 year design standards City wide.
20. Ask the water system and the electric board to enact a policy of not connecting permanent utilities until the certificate of occupancy is issued by the City. If they refuse to cooperate, enact a City ordinance making it illegal to connect permanent electricity or water to a building prior to the issuance of a certificate of occupancy by the City. Require the appropriate

utilities to comply with the provisions of the ordinance. The present ordinance makes it illegal for the owner to connect. Much of the responsibility needs to be placed upon the utility.

21. Develop a bank of engineers to conduct storm water reviews when staff is overloaded. Review and address the problems associated with the approval of retaining walls. Charge the contractor for the storm water review.
22. Conduct a comprehensive study of the possible consolidation of the City and county building code programs.
23. Over a period of three years increase inspection fees and license fees to pay the total costs for the building code inspection program.
24. Develop simple brochures explaining the permitting and inspection review process.
25. Develop a one-stop permitting system that only requires a builder to go to one location for a permit. A one-stop system does not require a separate visit to the planning commission, the water system, or the electric board.
26. Computerize the permitting and inspection process and have it accessible on line.
27. Assign a staff member to guide a builder through the permitting process on commercial and industrial projects. The City may want to do this on larger projects.
28. The City could benefit by developing standards for the time required in obtaining permits.
29. Properly allocated costs associated with the division to the division budget. All employees working in the division are not charged to the division budget.
30. An employee bonus program tied to developed standards may be beneficial for improving performance.
31. Over a period of three years increase inspection fees and license fees to pay the total costs for the building code inspection program.

32. Develop simple brochures explaining the permitting and inspection review process.
33. Develop a one-stop permitting system that only requires a builder to go to one location for a permit. A one-stop system does not require a separate visit to the planning commission, the water system, or the electric board.
34. Computerize the permitting and inspection process and have it accessible on line.
35. Assign a staff member to guide a builder through the permitting process on commercial and industrial projects. The City may want to do this on larger projects.
36. Reduce the time required for plan reviews to an acceptable standard.
37. The planning commission should establish development policies and the building code division should approve commercial and industrial projects based upon those policies. It may not be necessary for the planning commission to approve all individual commercial and industrial projects.
38. Establish a residential inspection unit to review and inspect all residential units.
39. Field inspectors complained that contractors requested an inspection and, when they arrive on the job site, the work often is not ready for inspection. Currently there is no charge for the first two inspections, which are not ready. The City does charge for the third and fourth inspections when the work is not ready and re-inspection is necessary. The City should consider charging a re-inspection fee when the inspector has to return at a later time for the same scheduled inspection as per the City ordinance.

I. Organization and Staffing

The Plans Review and Inspections Division is supported by the Operations and Engineering Department, which reports to the Mayor. The division is supervised by a Code Administrator, who performs the duties of Chief Building Official.

There are forty-six (46) employees, including part-time fire department personnel, working in the division of which thirty-two (32) are charged to the division budget:

- 16-inspectors
- 4-chief inspectors
- 8-support staff members
- 1-administrator
- 2-regular plan reviewers
- 1-chief building official (vacant)
- 1-sign inspector (vacant)
- 1-civil engineer (funded by engineering budget)
- 1-zoning inspector
- 1-KUB wastewater plan examiner (funded by KUB)
- 1-principal secretary (fire department budget funded)
- 9-fire department inspectors and reviewers (Most are part-time. All are funded in the fire department budget.)

The division director supervises and directs the following:

- The chief building official-presently vacant
- Administrative technician
- The chief building, zoning, signs & plans review inspector
- The chief gas, mechanical & plumbing inspector
- The chief electrical inspector
- The chief rehabilitation specialist
- Support staff

The chief building, zoning, and signs inspector supervises nine (9) employees: six (6) inspectors; two (2) plans examiners; and one (1) engineer. The chief gas, mechanical and plumbing inspector supervises seven (7) inspectors. The chief electrical inspector supervises four (4) inspectors. The chief rehabilitation specialist supervises one (1) inspector. The Fire Inspection Bureau provides one (1) plans examiner for fire reviews. Knoxville Utility Board provides one (1) wastewater plan examiner. There are four (4) chief inspectors. This report will not include the zoning inspector or the sign inspector as building inspectors for comparison purposes. Several staff members are at or near normal retirement age. The City will need to plan for the eventual replacement of some building inspectors and plan reviewers.

The surveys indicated that staff members receive adequate training in areas pertinent to their areas of responsibility. Since state law requires certified inspectors, the division leaves it to the individual inspectors to maintain certification requirements. The City pays for required training and other certification expenses.

The division director conducts staff bi-weekly and quarterly staff meetings on a regular basis with inspectors, reviewers, and support staff.

The division completed 30,335 inspections for 2003; issued 6,645 permits; and conducted 1,340 plan reviews while administering a program that includes over 1,200 sub-contractors operating in the City of Knoxville.

II. Adopted Building Codes and Appeal Boards

Building Codes

The following codes have been adopted by the City of Knoxville's Plans Review and Inspection Division:

- Standard Building Code (1999 edition)
- North Carolina Handicap Code (1991 edition with 1997 amendments)
- National Electrical Code (2002 edition)
- Standard Gas Code (1997 edition)
- Standard Mechanical Code (1997 edition)
- Standard Plumbing Code (1997 edition)

In addition the Fire Inspection Bureau reviews plans for compliance with:

- NFPA Life Safety Code (2003)
- Standard Fire Prevention Code (1997)

The Plans Review and Inspection Division is also responsible for enforcing the provisions of the City zoning ordinance as it relates to building construction.

With the development and publication of the family of International Codes in 2000, the continued development and maintenance of the model codes individually promulgated by the Standard Codes was discontinued. The International Building Code is intended to be the successor building code to those codes previously developed by the Southern Building Code Congress International, Inc. As of April 22, 2003 under the provisions of TCA 68-120-101 the City has the option of adopting the International Building Code (published by the successor entity created by the merger of the Southern Building Code Congress International, Inc.) Many Tennessee cities are concerned about the SEISMIC regulations contained in the International Building Code and are reluctant to adopt the code.

Recommendation:

Although the current strategy of waiting for revisions in the International Building Code relating to SEISMIC regulations or until the state adopts the code may be a reasonable approach, the City may want to consider adopting the code with the SEISMIC regulations deleted so that architects, engineers, and contractors can use new materials and methods contained in the International Building Code. A structural engineer could advise the City about which SEISMIC regulations to delete and which to retain.

Appeal Boards

The City has established the following appeal boards:

- Building Board of Adjustments and Appeals
- Electrical Board of Adjustments and Appeals
- Plumbing Board of Adjustments and Appeals
- Mechanical/Gas Board of Adjustments and Appeals

In addition to these building boards of adjustments and appeals the City Plans Review and Inspections Division provides support to the Board of Zoning Appeals.

The Building Board of Adjustments and Appeals and the Board of Zoning Appeals hear the vast majority of appeals. Contractors, architects and engineers responded that while appeal times are reasonable for a single appeal, the issues of an appeal are often referred to another appeal board process lengthening the time of the appeal process. The Electrical Board, Plumbing Board, and Mechanical/Gas Board usually meet quarterly and discuss code issues, trends, and needed amendments in general. An appeal process that takes too long a period of time discourages the use of the appeal process and may not serve the City well.

Recommendations:

1. Combine the Electrical Board, Plumbing Board, and Mechanical/Gas Board into the Building Board of Adjustments and Appeals Board or combine them into two appeal boards. This should simplify the appeal process and reduce the time needed to resolve issues. Most qualified Building Code Appeal members are also qualified to hear appeals in the other codes. Most contractors, architects, and engineers who serve on appeal boards, to some extent, perform work in electrical, plumbing, mechanical, or gas disciplines.
2. Presently contractors are charged from \$100 to \$200 to appeal a decision of the inspectors. Such fees that discourage appeals, should be refunded when the contractor's appeal is upheld by the appeals board.

III. Licensing and Fees

Contractor Licensing

Building contractors and sub-contractors are required to meet minimum standards and successfully pass a contractor's examination to qualify for a City of Knoxville's contractor's license. There are approximately 1,200 licensed sub-contractors operating within the City of Knoxville. Although the surveys indicated that some contractors regard

the requirement to purchase a City of Knoxville's Contractor's License, while already licensed by the state, as unnecessary license duplication, there is no authority in the various statutes authorizing cities to charge an additional "licensing fee" for contractors already licensed by the state. TCA 67-4-708 and 709 only permit local governments to collect the standard business tax rates applicable to contractors as "classification 4" businesses. TCA 7-62-103 purports to authorize local governments to enact ordinances for the protection of homeowners, relative to the licensing of contractors involved in construction of residential buildings. TCA 7-62-104, however, specifically exempts "any contractors licensed and qualified under the state contractor's law" from enforcement of local laws or ordinances relative to licensing by the local government. With regard to home improvement contractors, the code states that cities may not require additional licensing from persons licensed by the state to perform such work (TCA 62-37-105). Based upon these code sections, the City lacks authority to require state licensed contractors to obtain a City contractor's license, and in the opinion of the MTAS Legal Consultant, the City is actually prohibited from such practices.

City of Knoxville contractors are required to purchase a business license, provide evidence of workmen's compensation and liability insurance, and provide verification of state contractor's license for projects costing over \$25,000. The codes administrator and a Knoxville City attorney indicated that state licensed contractors are not required to obtain a City of Knoxville Contractor's license and that the City is in compliance with the state contractor's laws.

Recommendations:

1. The City should follow the state contractor's laws in regard to licensing.
2. Require all contractors to register with the City regardless of where licensed so that the City may communicate with the contractor when necessary.
3. Consider using a quarterly newsletter to communicate with registered contractors.

IV. Operating and Permitting Procedures

Contractors surveyed indicated that the building inspectors and the plan reviewers are not on the same page. They indicated that the plan reviewer does not use a standard check-off sheet to ensure that the plans review process is as complete as possible. When the review is incomplete, field inspectors are often placed in the position of having to add data to the original plans review report in the field. The process is frustrating to architects, engineers, and contractors. The inspectors are in effect moving the targets.

The building inspector does not receive a copy of the plans nor the plan reviewer's report. Of the three copies required for submittal, one copy is retained by the permitting office, one copy is returned to the contractor, and the final copy is retained by the engineering office if necessary. The contractor is responsible for keeping both the approved plans and the reviewer's report on the job site for use by the inspector and others. Inspectors may need to review the plans and specifications prior to visiting the job site.

Architects and engineers complained that City inspectors and plan reviewers are not licensed architects and engineers and often require unreasonable and non-code requirements. While architects and engineers are certified to certain professional standards, municipal building officials are also certified in their areas of responsibility. Both are interested in preserving the health, safety, and property values for the community. Providing the inspector with a copy of plans and reviewer comments may be a step toward better understanding of the respective roles of designers and inspectors.

While it may be desirable to have the fire department review all commercial and industrial building plans, mechanical inspectors should be certified to routinely conduct sprinkler, fire extinguishing systems, and fire code construction materials. The fire department could be consulted on technical fire standards and specifications and the department could provide the contractor with a list of additional equipment that may be required. The fire department's time involved in the review process should be minimized, as well as the number of reviewers.

Architects and engineers identified the storm water regulations as being too restrictive and the reviews taking too much time. They complained that the City does not allow covered retention facilities and the approval of retaining walls takes far too long. The City uses the 500-year event storm water design standards, which are more restrictive than the 100-year event standards used by many other cities in Tennessee.

The City allows for fast track construction whereby contractors may begin site work, complete foundation work, and complete shell construction in permitted phases. The City appears to be taking advantage of the fast tracking process in order to speed up construction on some projects. The City also provides a telephone database that allows contractors to monitor the status of their reviews and inspections. The City should outline the steps needed to implement one-stop permitting and implement the steps.

When all construction is completed according to approved plans and specifications, a certificate of occupancy may be issued. The building code allows for a temporary certificate of occupancy under some conditions. Many times the owner or tenant moves into the building prior to the issuance of the certificate of occupancy, which is a violation of code requirements. This makes enforcement efforts much more difficult. The permanent connection for either water or electricity is conditioned by City ordinance upon the issuance of a certificate of occupancy from the City and its provisions should be enforced.

The City uses a computerized complaint tracking system and complaints received are assigned to appropriate staff for resolution.

Contractors are faced with licensing requirements, permitting procedures, zoning requirements, fire code requirements, insurance issues, engineering and storm water requirements, and other complex requirements. One of the ways to make the permitting process work more efficiently is to assign a staff member to guide a builder, especially on large projects, through the permitting process on commercial and industrial projects.

Staff surveys indicated the need for more direction and leadership in the division. MTAS believes that an effective operating procedures manual can resolve some of the issues.

Permits

The division allows building and trade contractors to do business within the City of Knoxville by completing an application and making an initial minimum deposit of \$500.00 to a trust account. Permitting fees may be charged against the trust account. The contractors receive notice when the account is \$100 or less. The division also accepts payments of check, cash, and credit cards (Visa and Master Charge only).

The City of Knoxville allows for fast track construction whereby contractors may begin site work, complete foundation work, and complete shell construction in permitted phases. The City appears to be taking advantage of the fast tracking process in order to speed up construction on some projects. The City also provides a telephone database that allows contractors to monitor the status of their reviews and inspections. The City appears to be close to having a one-stop permitting process.

Recommendations:

1. The City should develop a division operating procedures manual.
2. The City should complete the development of a one-stop permitting process.

The Permitting Process

a. Trade Permitting Process - For small contractors performing construction trade work on a contract basis. Basically the trade permit process is dependent only upon verifying the license and collecting the permit fee. After this is accomplished, a permit is issued.

b. Plans Review for Building Permit -

1. The contractor submits three copies of plans to the permit office.
2. An application is entered into the automated PPLUS database.
3. The permit writer prepares a routing sheet and places the application, plans, and routing sheet in a numbered bin.
4. Plan examiners access PPLUS action screen and queries a list of pending plans for required review. Each required examiner has plans on his or her daily list.
5. The examiner retrieves the plans from the numbered bin in the permit office and reviews the plans.
6. Examiner approves or disapproves and enters information into PPLUS.
7. Examiner returns plans to the bin for the other reviewers who review in a similar manner.
8. The permit writer searches on approve/notify or disapproved/notify and queries a list of plans. He/she launches conditions report.
9. The permit writer sends approval/disapproval letter to the applicant. Disapproved plans must be revised and be resubmitted to the appropriate permit office.
10. The contractor picks up permit.
11. A copy of approved plans, plans review application, and conditions sheet is forwarded to engineering office for microfilming; a copy is returned to the contractor, and a copy remains in the permitting office until 2 years after it has been permitted.
12. The contractor begins work.

c. Sign Permit Process

1. The contractor comes to the permit office and completes an application.
2. Permit writer enters into PPLUS.
3. Permit office collects fee.
4. The application is forwarded to the inspector.
5. Inspector approves or disapproves application.
6. If the application is approved the approval is entered into PPLUS. Disapproved conditions must be resolved.
7. The permit is printed and filed.
8. The permit is mailed to the applicant.

Permit Fees and Revenue

Comparison of Building Permit Fees and Plan Review Fees

Building Permit Fees	Knoxville	Chattanooga	Clarksville	Ashville, NC	Columbia, SC	Farragut
Residential \$100,000	\$417	\$460	\$460	\$350	\$400	\$460
Commercial \$500,000	\$1,617	\$1,660	\$1,660	\$4,250	\$2,300	\$1,660
Plan Review Fees						
Residential	\$50	\$230	\$0.00	\$0.00	\$40	\$230
Commercial	\$400	\$8300	\$830	\$0.00	\$230	\$830

Note:

International Code

Council plan review fee

for \$500,000 building \$650.00

is .0013 of value.

The City of Knoxville Building Codes Inspection Program revenue for the year ending June 30, 2003 was \$1,567,000 and expenditures totaled \$1,748,000. (The FY 2004-2005 budget totals \$1,873,710.) Expenditures exceed revenues by \$181,000 or revenues were 89% of expenditures. Recent annual figures placed revenues at 104% of expenditures in Winston-Salem, North Carolina; 116% of expenditures in Fort Collins, Colorado; and 147% of expenditures in Iowa City, Iowa. While the City is to some extent subsidizing the cost of the building codes inspection program from the general fund, some cities desire to do so to promote growth and development. Note: Budget expenditures may be underestimated by as much as \$300,000 considering non budgeted personnel working within the division.

Recommendations:

1. The City may want to consider asking the architect, engineer, or contractor if they want to fast-track their project by attending pre-design meetings and pre-construction meetings. Such meetings can minimize many of the issues by making the applicant aware of the design standards and construction procedures required by the City. The City currently provides pre-design and pre-construction meetings only upon request and the service is not well used. During the plan review process deficiencies may be noted that can be immediately communicated to the architect, engineer, or contractor and save valuable design and construction time.

2. The City should develop a fast-track process to advise the owner, architect, engineer, or contractor of deficiencies noted prior to the completion of the review, particularly if the deficiencies are significant. If there is a significant structural problem identified, and the plans examiner has completed his part of the review, why should the customer have to wait until the fire inspection review is completed to learn of the deficiency? In some instances the review process may be up to thirty (30) days.
3. Develop a division operating procedures manual.
4. Require the plans reviewer to use a standard check-list to minimize the need for additional check-lists to be initiated in the field. Provide the field inspector with a set of approved plans and the reviewer check-list for review prior to the inspection.
5. The Inspection Division's mechanical inspectors should routinely review and inspect buildings using the Standard Building Code, which is written and developed to be in compliance with the fire code.
6. The City may want to reconsider its policy on not allowing covered storm water retention facilities and establish a standard period of time for storm water reviews to be completed. The City also may want to consider using local engineering firms to assist in storm water reviews when reviews cannot be accomplished in a reasonable period of time. The City may also want to consider using the 100 year event standard for storm water facility design in some areas of the City instead of using the much stricter 500 year design standards City wide.
7. Ask the water system and the electric board to enact a policy of not connecting permanent utilities until the certificate of occupancy is issued by the City. If they refuse to cooperate, enact a City ordinance making it illegal to connect permanent electricity or water to a building prior to the issuance of a certificate of occupancy by the City. Require the appropriate utilities to comply with the provisions of the ordinance. The present ordinance places the responsibility on the owner, not the utility.

8. Develop a bank of engineers to conduct storm water reviews when staff is overloaded. Review and address the problems associated with the approval of retaining walls. Charge the contractor for the storm water review.
9. Conduct a comprehensive study of the possible consolidation of the City and county building code programs.
10. Over a period of three years increase inspection fees and license fees to pay the total costs for the building code inspection program.
11. Develop simple brochures explaining the permitting and inspection review process.
12. Develop a one-stop permitting system that only requires a builder to go to one location for a permit. A one-stop system does not require a separate visit to the planning commission, the water system, or the electric board.
13. Computerize the permitting and inspection process and have it accessible on line.
14. Assign a staff member to guide a builder through the permitting process on commercial and industrial projects. The City may want to do this on larger projects.
15. The City could benefit by developing standards for the time required in obtaining permits.
16. Properly allocated costs associated with the division to the division budget. All employees working in the division are not charged to the division budget.

V. Plan Reviews and Inspection Services

Number of Inspections

The City performed a total of 30,335 inspections during 2003 including 15,145 inspections on commercial/multi-family structures. During the same period of time the City performed 15,190 residential inspections or an average of 10 each day per inspector.

For analysis purposes MTAS used 260 work days per year for each inspector (less 24 days vacation, 12 days sick days, and 9 holidays) or 215 days. With 30,335 total inspections per year, the per-day inspections for 16 inspectors would be 8.82 inspections per day per inspector, not including chief inspectors, the zoning inspector, fire inspectors

or the sign inspector. The division issued 6,645 permits for the year. In 2002 the division issued 14.77 permits per day for single family residences with an estimated value of \$116,800. Five percent (5%) of inspections resulted in re-inspections and three percent (3%) resulted in stop-work orders. When comparing the number of inspections per day with other jurisdictions, it is important to note whether or not the same types of inspectors are consistently included in the computations.

“It is reasonable to expect building inspections to be performed within 2 workdays from the time requested. More aggressive inspection operations often can perform building inspection on the day requested.”¹ Building inspectors should provide more prompt inspections of footing, foundations, and forms for the placement of concrete in order to avoid costly delays for contractors. “Average inspector workload varies by inspection. On the basis reported figures, a workload of 10 to 16 general building inspections per day seems reasonable, as do slightly lower numbers of electrical, mechanical, or plumbing inspections.”²

“The amount of time an inspector spends on each inspection may, of course, influence daily workload. By holding down the inspector’s time per inspections, inspector workload may be increased. Quantity gains, however, may be negated by quality losses if inspectors speed results in faulty inspections. It may be reassuring, therefore, to fall within the band of average inspection times among other cities. Lying outside these bounds at either extreme may be a cause for concern-too slow and perhaps wasteful at one end and too fast and perhaps error-prone at the other. The LLC (1994) contends that an inspector of single-family residential units working for a high-service-level residential department should be able to complete 12 framing or foundation inspections per day. Fewer than 12-or more than 20-may signal problems and a low service level.”³

Recommendation:

An employee bonus program tied to developed standards may be beneficial for improving performance.

Plan Reviews

The City requires detailed structural plans for all multi-family and commercial projects. Detailed plans for one and two family dwelling projects are not required. Detailed structural building code plan reviews are not performed on new one and two family dwellings. A detailed building code plan review is performed even when a registered design professional--certified in the appropriate field--has signed and sealed

¹ Assessing Local Performance and Establishing Community Standards

² Ibid.

³ Ibid.

the plan. Since standards vary from community to community, this appears to be a good practice.

“Careful review of construction plans prior to the issuance of a building permit is an important protection of the public interest. From the prospective of builders and their clients, however, a slow review can also mean expensive delays in the construction process. New York’s building code requires examinations of plans within 40 days of receipt, but plans for new buildings were examined within an average of 19 working days in 1992. Houston, Texas, reported reviewing 60% of all plans in 1 day or less, 80% within 7 days, and 90% within 14 days. Oakland, California reviewed 90% of all new construction plans within 20 days during a recent year, 85% of the plans for major additions or alterations within 15 days, and 95% of the plans for minor additions or alterations within 10 days. Corpus Christi, Texas, reported an average cycle time for its permits and plan review process of 3 to 10 days with 92% completed within 7 days. Cincinnati, Ohio, attempts to maintain an average plan review time of 7 workdays or less and reported an average of 4.2 days in 1991. An average plan check turn around time of 5 days was reported by Iowa City, Iowa, and Decatur, Illinois. The average plan check backlog in Long Beach, California dropped from 7.5 days in 1991 to 3.95 days the following year. These averages included residential and commercial. It appears reasonable to expect a building permit review within 4 weeks for most commercial projects and within 2 weeks for most residential buildings. A review of construction plans for fire safety purposes may be performed by building officials, but often is performed by fire department personnel. All reporting municipalities indicated completion of most such reviews within two weeks.”⁴

There were 22 permits issued for commercial buildings with over \$500,000 in value from January 1, 2004 to June 9, 2004. The average work days from applied permits to approved permits was 34.82 days. The permits required 1.18 average revisions.

There were 24 permits issued for residential buildings over \$250,000 in value from January 1, 2004 to June 9, 2004. The average work days from applied permits to approved permits was 10.83 days. The permits required .54 average revisions.

A review of permits issued for residential buildings less than \$25,000 in value for the same period indicated 118 permits required with average revision submittals of .07. The average work days from applied for permits to approved permits was 3.02 days.

With 1,340 plan reviews per year with eight reviewers (two regular reviewers, one engineer, one fire reviewer, and four chief inspectors), the plan reviews per day are .78 per day.

⁴ Assessing Local Performance and Establishing Community Standards

Recommendations:

1. Over a period of three years increase inspection fees and license fees to pay the total costs for the building code inspection program.
2. Develop simple brochures explaining the permitting and inspection review process.
3. Develop a one-stop permitting system that only requires a builder to go to one location for a permit. A one-stop system does not require a separate visit to the planning commission, the water system, or the electric board.
4. Computerize the permitting and inspection process and have it accessible on line.
5. Assign a staff member to guide a builder through the permitting process on commercial and industrial projects. The City may want to do this on larger projects.
6. Reduce the time required for plan reviews to an acceptable standard.

Planning Commission Review:

The City requires all commercial and industrial projects be reviewed by the planning commission. The planning commission should establish policies and procedures and allow the building codes division to approve commercial and industrial projects in conformance with their regulations. Builders complain that approval by the planning commission is an unnecessary step. A building code division staff member can call and get a building address from a planning commission staff member. It may not be necessary for the planning commission to review all commercial and industrial projects.

Recommendation:

The planning commission should establish development policies and the building code division should approve commercial and industrial projects based upon those policies. It may not be necessary for the planning commission to approve all individual commercial and industrial projects.

Inspections

Inspections Process

1. The contractor calls the IVRS for an inspection. For fire inspections the applicant must call the fire department.
2. An inspector worksheet is printed the next morning from permits report module.
3. The inspector calls the contractor to discuss conditions and confirm time for inspection.
4. The field inspection is made.
5. The inspector leaves an approval or disapproval tag at the job site.
6. The contractor can call IVRS to check on the status of an inspection or contact the inspector directly.
7. The contractor calls for a certificate of occupancy when required.
8. The approved inspections are reviewed and the code administrator may issue a certificate of occupancy when all code requirements are met.

Recommendations:

1. Establish a residential inspection unit to review and inspect all residential units.
2. Field inspectors complained that contractors requested an inspection and, when they arrive on the job site, the work often is not ready for inspection. Currently there is no charge for the first two inspections, which are not ready. The City does charge for the third and fourth inspections when the work is not ready and re-inspection is necessary. The City should consider charging a re-inspection fee when the inspector has to return at a later time for the same scheduled inspection as per the City ordinance.

VI. Comparison With Other Cities

Computer System Review

The Nashville codes program states that because the Department of Codes Administration is vested with the authority and duty to administer comprehensive zoning provisions, as well as to issue building permits, and use and occupancy certificates-it then becomes quite natural for the codes department to function as an “umbrella” agency administering the permit process. Under their program the various departments and agencies with an interest in the permit process (public works, water services, fire marshal,

health department, historic commission, planning commission, and others) have been linked up electronically through a common computer program and a common database to facilitate processing of applications for permits. This process is commonly referred to as “permit tracking”. It is through this common tracking system that departments and agencies freely share access to the permit process, administered at the department of codes administration. To further facilitate the effective delivery of services in processing applications for building permits (and for customer convenience) departments, which have the greatest input into the permit process have located “outposts” of their departments at the offices of the codes department. Thus, the “One Stop Shop” for building permits. Over 87% of all permits issued by the codes department are issued during a single visit to the codes office. 51% of permits are issued through the use of contractor debit accounts –without the contractor ever setting foot in the codes department.

Nashville also uses Fast Track Permits to accommodate tight construction schedules, allowing building permits to be issued in phases. Through the issuance of separate foundation, structural framing, shell and finish out permits, buildings can come out of the ground as plans are being “fast tracked” by designers. Building permit applications for later construction phases can be pursued while construction progresses. The advantages of phased permit issuance are apparent. It saves time and allows an early start.

The City of Knoxville allows for fast-track construction whereby contractors may begin site work, complete foundation work, and complete shell construction in permitted phases. The City appears to be taking advantage of the fast tracking process in order to speed up construction on some projects. The City also provides a telephone database that allows contractors to monitor the status of their reviews and inspections. The City appears to be close to having a one-stop permitting process.

Huntsville, Alabama has an excellent computerized internet based code permitting and inspection data base system that should be reviewed should the City desire to expand the present computer data system into an Internet based system.

Benchmark

Data taken from the University of North Carolina Benchmark Project was used to compare with data for the City of Knoxville. While the data should not be viewed as 100 percent reliable, it should indicate areas where the City should look for improvement and standards.

City of Knoxville Building Code Assessment				
	High Point, NC	Cary, NC	Greensboro, NC	Knoxville, TN
Population Served	93,835	112,365	228,311	174,000
Land Area Served (sq.mi.)	55.16	57.80	116.60	101.74
Persons Served per (sq.mi.)	1,701	1,944	1,958	1,710
Tax Base Served-assessed value	\$6,589,267,109	\$12,208,703,008	\$16,742,100,000	\$2,480,556,000
Cost Breakdown in Dollars				
Personal Services	\$1,303,472	\$2,488,494	\$1,982,147	\$1,381,000
Operating Costs	\$409,719	\$618,201	\$1,059,967	\$367,000
Capital Costs	\$116,854	\$212,047	\$0	\$0
Total	\$1,830,045	\$3,318,742	\$3,042,114	\$1,748,000
Service Profile				
No. of Inspections by Type				
Building	11307	18625	25481	8576
Electrical	6224	8847	17792	8114
Mechanical	8950	9705	15925	5721
Plumbing	7378	6741	13585	7924
Total	33859	43918	72783	30335
Building Permit Values				
Residential	\$38,340,905	\$106,805,188	\$186,725,021	\$53,501,560
Multi-family	\$127,497,951	\$5,253,925	included below	\$14,345,277
Commercial	\$59,601,206	\$153,822,590	\$255,498,316	\$226,093,772
Total	\$225,440,062	\$265,881,590	\$442,498,316	\$293,940,609
FTE Inspectors				
Building	5	9	7	5
Electrical	3	4	7	4
Mechanical	3	3	4	included below
Plumbing	3	3	3	7
Total	14	19	21	16
FTE Plan Reviewers	1	5	4.5	8
Other FTE Positions	5	9	15	24
Inspection Fee Revenue	\$1,394,721	\$80,686	\$1,487,503	\$1,567,000
Inspections per sq. miles	614	760	624	298
Cost per Inspections-all Types	\$54	\$76	\$42	\$58
Plan Reviews Per Reviewer	1498	1013	421	168
% Inspections That are Reinsp.	18.50%	31.40%	18.50%	5%
Inspections per Day per Inspector	10	10	15	8.82
Inspections per 1,000 Population	361	391	319	174

VII. Survey Reviews

Architects & Engineers Survey

Survey questionnaires were mailed to twenty (20) architects and engineers selected from the telephone directory. 20% responded.

Only 40% responded that plans are reviewed promptly. Forty percent (40%) responded that it takes over 16 days to receive the results of the plans review. Eighty percent (80%) were required to have planning commission review. Sixty percent (60%) reported a good assessment of the plans review process and 60% reported that inspections are performed promptly. Sixty percent (60%) responded that inspectors spent adequate time explaining deficiencies.

When asked what improvements could the City make in plans review and inspection programs the responses received were:

- Combine City and county building code programs
- Require reviewers to use a review checklist
- Inspectors should follow the work of the plan reviewer and work from the reviewer's list instead of creating another
- Resolve the indecision on retaining walls
- Have faster turn around on small projects
- Have plan reviewers and inspectors on the same page

One hundred percent (100%) of the architects and engineers responded that they would use Internet software if adopted by the City. One hundred percent (100%) also responded that permit fees are reasonable.

In response to what three improvements should be made in the building codes program the replies were:

- Adopt a single code
- Combine City and county building code programs
- Get Farragut on the same page
- When doing plan reviews, conduct 100% of the review
- Allow partial permitting
- Allow temporary certificates of occupancy
- Update the zoning ordinance and allow mixed use and urban planned developments

One hundred percent (100%) of architects and engineers responded that the City and county building code programs should be consolidated.

The most significant problems encountered in the building code inspection program were identified as:

- Inspector interpretation varies from the code
- Uninformed inspectors
- Failure to recognize effect of minor revisions on total project
- Codes are outdated
- Storm water code is too stringent
- There is a lack of mutual respect between plan examiners and inspectors

Architects and engineers surveyed indicated the need to adopt the International Building Code, current edition. The code provides for the use of more modern materials and design standards.

General Contractors. Large Contractor Survey

Twenty-seven larger contractors selected from the telephone directory were surveyed. The response rate was 26%.

Eighty-five percent (85%) felt that permit applications are processed promptly. Seventy-nine percent (79%) felt that plan reviews are performed promptly. 75% felt that problems encountered in the plan review process are addressed timely. Eighty-five and eight tenths percent (85.8%) felt that inspections are prompt. 80% felt that inspectors have a good knowledge of the code requirements. Eighty percent (80%) felt that inspectors spend adequate time explaining discrepancies. Only 20% use the Interactive Voice Response System (IVRS). One hundred percent (100%) would use an Internet system of code administration. One hundred percent (100%) would like one-stop-permitting. Most contractors do not have problems communicating with inspectors and most stated that personnel and inspectors are courteous. One hundred percent (100%) felt that the City and county building code programs should be consolidated.

When asked the most significant problems that they encounter in the building plan review and inspection code program the responses were:

- There is an inconsistency of code decisions between inspectors
- Attitude of inspectors and staff
- Too many additional requirements imposed in the field

Trade Contractors Survey

Copies of the survey were available at the codes office for trade contractors to complete as they came to the division. Seven trade contractors responded to the survey.

Sixty-two and one-half percent (62.5%) felt that permits are processed promptly. Fifty-seven and two tenths percent (57.2%) felt that plan reviews are processed promptly. Eighty percent (80%) felt that the plans review process is too slow. Eighty-five and eight tenths percent (85.8%) felt that inspections are performed promptly. Eighty-five and eight tenths percent (85.8%) felt that inspectors have a good knowledge of code requirements. Seventy-one and one-half percent (71.5%) felt the inspectors are fair in

their interpretations of the codes. Seventy-one and one-half percent (71.5%) of responders use IVRS. One hundred percent (100%) had not filed an appeal within the past 12 months. Sixty-six and four tenths percent (66.4%) felt that permit fees are reasonable.

Staff Inspectors and Plan Examiner Survey

Surveys were distributed to inspectors and examiners. Seven (7) of 21 or 33% of inspectors and examiners responded.

Seventy-one and one-half percent (71.5%) felt that code update training is adequate. One hundred percent (100%) stated that they have enough time to complete assigned task. Seventy-one and one-half percent (71.5%) felt that staffing is adequate. One hundred percent felt that training provided is adequate. One hundred percent (100%) reported that they are supported in enforcement efforts.

When asked what can be done to improve the permitting process, the responses were:

- Appoint a chief over inspectors and let contractors call inspectors directly
- Provide better parking for customers
- Provide better training for support staff
- Provide training for inspectors dealing with problem clients
- Educate the public about the inspection program and its benefits
- Provide computers in cars
- More pay for additional certifications

The responses to the question what is the greatest problem that you face were:

- Work is not ready when inspection is called for
- Lack of incentives
- Not enough guidance
- Untrained electricians in the field
- Homeowner permits should require interview with chief inspector

The responses to what changes would you make were:

- Provide one building for codes with adequate parking
- Bring fire review within codes building

Compensation

- Sixty percent (60%) felt that compensation and benefits are inadequate.
- Pay for performance and merit pay questions were mostly ignored indicating, in my judgment, a dislike for them.

Administrative Staff Survey

Four of eight responded or 50%.

Seventy-five percent (75%) responded that the compensation system is not administered fairly. Only 50% think training is adequate. One hundred percent (100%) have adequate time to perform assigned tasks. Seventy-five percent (75%) responded that employee benefits are adequate. Seventy-five percent (75%) felt that the communications system is inadequate. Seventy-five percent (75%) felt that additional staff is not needed.

Summary

Surveys indicated that overall the Building Plan Reviews and Building Inspections Division is well administered and in the words of one architect “the division is headed in the right direction.” Plan reviews and inspections are completed in reasonable periods of time and the staffing level is adequate. Major issues that need to be addressed are reducing the permitting time, adopting the most updated building codes that provide for new methods and materials, and improving the coordination of reviews and inspections. The City is in a good position to begin using Internet based software for building plan reviews and inspection services. When implemented the recommendations within this assessment report should help in effectively addressing these major issues and improve the plan review and inspection program.