

# **CITY OF CHATTANOOGA DIVISION OF CODES & INSPECTION**

## **MTAS REVIEW**

### **ASSIGNMENT AND APPROACH**

Public Works Director Bill McDonald requested MTAS assistance in evaluating the Department's Division of Codes and Inspection. Specifically, he requested MTAS to:

- review the division's plans review, inspection and management processes and functions;
- research and make recommendations on the information storage and retrieval system for plans, permits, complaints and inspection records;
- make recommendations on equipment needs;
- evaluate and recommend methods to improve processing of applications for permits and permit fees;
- evaluate proposed office layout;
- review and make recommendations on locally adopted policies and regulations;
- make recommendations to improve customer service; and
- compare the city's codes and inspection operations with similar operations in other cities.

MTAS approached this project by interviewing employees, especially those in key positions within the division, employees from other departments involved with codes and inspection (such as finance, information services and the treasurer) and by talking with customers who use the division's services. In all, 28 persons were solicited for input. MTAS analyzed budgets, statistical reports, written procedures, the proposed new office layout and other written information provided by city staff. MTAS researched the organization structure, technology tools and performance of other similar municipal operations, in-state and out-of-state.

MTAS thanks Director Don Young and the staff for cooperation and assistance they provided. We especially appreciate the time staff devoted to interviews.

## **I. PURPOSE OF THE DIVISION OF CODES AND INSPECTION**

The Codes and Inspection Division is charged with the responsibility of enforcing the city's building codes, construction related ordinances and zoning regulations to ensure that structures within the city are built to minimum requirements to protect lives and to conform with environmental and aesthetic requirements. The division's work is accomplished through:

- (1) providing information to developers, builders and citizens;
- (2) testing of contractors and issuance of licenses;
- (3) plans review;
- (4) issuance of building permits;
- (5) field inspections; and
- (6) resolution of disputes through boards and/or environmental court.

This division works closely with other city divisions and departments, such as engineering, water resources, traffic and fire and with non-city owned utilities to accomplish its' objectives.

The city has adopted the following life safety codes:

- 1999 Standard Building Code
- 1997 Standard Plumbing Code
- 1997 Standard Mechanical Code
- 1997 Standard Gas Code
- 1999 National Electrical Code
- 1997 National Fire Protection (NFPA) Fire Code
- 1997 Life Safety Code (NFPA 101)

In addition the division enforces the following:

- 1991 North Carolina Handicapped Code (w/ 1997 revisions)
- 1995 Model Energy Code
- 1995 Chattanooga Zoning Ordinance
- Local ordinances dealing with stormwater, landscaping, urban forestry, signs, traffic engineering and sanitary sewers

This division supports and administers these boards:

The Board of Mechanical Examiners

- The Board of Electrical Examiners
- The Board of Gas Examiners
- The Board of Plumbing Examiners
- The Board of Sign Appeals

- The Board of Zoning Appeals for Variances and Special Permits
- The Construction Board of Adjustment and Appeals

## II. CURRENT OPERATIONS

### Sub-Unit Responsibilities

The Division of Codes and Inspection consists of a division director and 28 employees organized into 6 sub-units as shown on the organizational chart in Exhibit A. Here's a brief description of the work of each sub-unit:

1. Office Manager – the office manager is an administrative assistant to the director and secretary to inspectors; the position supervises 4 permit clerks. This sub-unit performs secretarial duties, customer service, assists contractors with approvals for sewer, street cuts and sign permits; issues permits; enters permits into the Public Works Permits data tracking system (PWPE); issues building inspectors field cards; processes sign variances (including accepting applications and payments and forwarding copies to the chief sign inspector and the city attorney); receives payments for permits, licenses, sign variances and the sewer payment plan; issues daily collections reports; acts as secretary to boards; assists with license testing; files hard-copy permits; mails permits to contractors; maintains contractor file on PWPE including annual billing for licenses for electric, plumbing, and gas/mechanical and researching with the state and county to determine if contractors have valid licenses; logs inspection files into PWPE; enters investigations into PWPE; maintains flood-zone files; maintains zoning complaint files; and performs other office duties.
2. Codes Coordinator – reviews all plan submittals to ensure compliance with building/life safety codes (building, plumbing, mechanical, gas, electrical and fire protection). This sub-unit consists of a senior codes coordinator and a codes coordinator. This is usually the first point of contact for plans submittal, and this sub-unit is a focal point of communication – office visits and phone calls from owners, engineers, contractors and developers.

This sub-unit receives three full sets and five civil sets of plans, logs the plans and takes them to engineering. Engineering checks for address, legal description, zoning, flood plain and sewer availability. The codes unit takes and picks up plans from engineering twice a day. If there are no engineering problems (for example a problem that may halt review is lack of sewer availability), then the codes personnel takes plans to the city hall annex building where review is conducted for environmental issues.

At the city hall annex, the Development Coordinator logs plans into a database usually on the same date of receipt. The time period from the initial receipt of plans from a contractor until the time environmental review begins is 2-3 days. Generally, codes staff awaits the approval of environmental reviewers before beginning life safety reviews.

3. Building and Zoning – this sub-unit consists of a chief building inspector, a senior building inspector, 2 building inspectors and 2 zoning inspectors. The primary responsibilities of this sub-unit are field inspection of all new residential and commercial construction, renovation, demolition and investigation and resolution of zoning complaints. Field inspections include footings, foundations, floor systems, wall and roof framing, insulation and finals. Zoning inspectors enforce the city's zoning ordinance. About 75% of the zoning inspector's work originates from complaints and about 25% from problems identified by the inspectors

This sub-unit divides the city into 4 zones for building inspection with the chief building inspector working the downtown area and the remainder divided by workload except one inspector handles all hospital inspections. The chief building inspector issues compliance letters (hand-written, then typed by clerks), checks all beer applications, checks variance requests for the Board of Zoning Appeals and Construction Board of Adjustment and Appeals, resolves problems between inspectors and contractors, conducts weekly training sessions for his unit, spot checks large projects and spends 15-20% of his time in environmental court. The city is divided into two zones between the two zoning inspectors.

A typical day for staff is: at the office at 8:00 a.m.; on the phone scheduling the day's inspections from 8:00 a.m. – 8:45 a.m.; field inspections (8-10/day/inspector); back in office by 4:00 to finalize inspection reports (manual record), resolve problems encountered in field work, check plans (if needed) and begin scheduling next day's work.

4. Signs Inspection – This sub-unit consists of a chief sign inspector and 2 electrical sign inspectors. Their primary responsibilities are plans and specifications review and field inspections for all outdoor signs including electrical signs. Staff also administers monthly meetings of the Board of Sign Appeals.

The chief divides work into two city zones with the chief inspector providing backup field inspection. This sub-unit performs 4-5 field inspections/day/inspector. Sign plans are submitted by contractors directly to the chief sign inspector. He reviews all plans (usually within 2 days of receipt), handles all pre-construction inquiries from contractors, meets in the field with inspectors to resolve problems and participates in monthly Board of Sign Appeals meetings.

5. Plumbing, Gas and Mechanical Inspection – This sub-unit consists of a chief inspector, a senior plumbing inspector, 2 plumbing inspectors, a combination

inspector, a senior gas/mechanical inspector and a gas/mechanical inspector. This sub-unit reviews plans, performs field inspections and administers the licensing process including conducting tests for local plumbing and gas and mechanical license tests.

The chief divides work among inspectors based on city zones and individual workloads. The chief also resolves problems between inspectors and developers, administers the Board of Plumbing Examiners, works closely with the Fire Marshal on review of hoods for restaurants and sprinklers, works with Division of Water Resources on enforcing the sewer use ordinance in regard to grease traps and serves on the city's Safety Review Board. He also conducts training sessions for staff every other week. The chief works cases through environmental court. Each case takes 10-15 hours each and there is about 1 case every other month. This sub-unit performs 7-8 inspections/day/inspector as well as plans review.

6. Electrical Inspection – This sub-unit consists of a chief electrical inspector, a senior electrical inspector, 2 electrical inspectors and a combination inspector. Currently, the chief inspector position is vacant. This sub-unit divides work into 4 zones covering the entire city. Traditionally, the chief inspector handles routine inspection of licensed electricians' work at manufacturing facilities. But, this task has not been done in 2-3 years due to work volume and most recently shortage of staff. The senior inspector takes the lead on interfacing with contractors and developers. He also conducts weekly training.

This sub-unit reviews plans and performs inspections of electrical systems of new and existing structures for compliance with applicable codes. They inspect electrical wiring, materials, industrial machinery and other electrical components. They assist the Fire Marshal's office, and review amendments to the electrical code. They work with the inspectors of Codes and Community Services on housing problems. Permanent power connection is only allowed when authorized by the electrical inspectors. These inspectors average 8-9 inspections/day/inspector.

## **Involvement of Other City Departments and Divisions**

Referring back to the discussion under Codes: as mentioned, codes personnel hand deliver two sets of plans to the city hall annex building where review is conducted for environmental issues.

There, the Development Coordinator logs plans into a database usually on the same date of receipt. Plans are stored in a central location and the following reviews occur:

- (1) Stormwater – reviews plans for compliance with stormwater ordinance and for compliance with erosion control measures;

- (2) Landscaping – reviews plans for compliance with the city’s landscape ordinance;
- (3) Engineering – reviews plans for streets, curbs, gutters, sidewalks and subdivision and replatting of property;
- (4) Urban Forestry – reviews plans to determine if the project will impact publicly owned trees; reviews street yard tree plantings for compliance with utility line requirements and coordinates with streetscape projects;
- (5) Sanitary Sewer – reviews plans for impact on the use of the city’s sewer system;
- (6) Traffic Engineering - reviews plans for impacts to local traffic, access to the site, capacity required for parking lots and requirements for handicap parking in compliance with city codes and zoning ordinances.

Environmental reviewers make notations on the plans and “approve” the plans with an official stamp. During the environmental review, each reviewer may interact with contractors, owners and developers requesting plan amendments, clarification and so forth. In addition, they usually conduct field visits. At the end of the environmental review, two sets of plans are stamped approved by all the appropriate environmental reviewers. Environmental review generally takes 10 days. It may take significantly more than 10 days if there are substantial problems with the plans.

After environmental review and approval, two sets of plans with environmental approval stamps are taken back to Codes. Codes staff performs and/or coordinates architectural, structural and life safety code reviews. As mentioned above, electrical, plumbing, gas and mechanical inspectors have assigned sections of the city as their service area. *Each inspector reviews plans for his respective subject area of expertise.*

Codes staff performs the following reviews:

- fire/life safety reviews – to insure compliance with the Life Safety Code and National Fire Code. This review is coordinated with the Fire Marshal. Each Monday, codes staff faxes a copy of permits from the previous week to the Fire Marshal. From review of the list and from talking with codes staff, the Fire Marshal’s inspectors determine which structures need plans review and inspection. The Fire Marshal attends pre-submittal meetings upon invitation by Codes. Sprinkler plans are submitted directly to the Fire Marshal’s office by contractors/developers.
- structural review – to insure compliance with structural load requirements per occupancy, snow, wind and seismic loading.
- architectural review – to insure compliance with the Standard Building Code, North Carolina Handicapped Code and Model Energy Code.

At the end of the entire plans approval process, one set of stamped approved plans is returned to the owner/developer, and the approved second set is kept on file for several months in the division. Eventually, approved plans are stored in the city’s file storage facilities.

## Division Budget

This division pays its way. It earns enough in permit revenues to fund operations. The city's total FY 2001 budget for operation of the codes and inspection division was \$1.26 million. For FY02, the division's budget is \$1.3 million. For the last two years, the division has generated >\$1 million in permit fees. Figures 1 and 2 show the number of permits issued and revenue generated since 1994. Figures 1 and 2 delete street cut permits and revenue. All figures presented in this report are derived from the division's statistical information shown in Exhibit B.

In September 2001 the city's governing body adopted new fees. The new fee schedule adds numerous new fees. The new fees are expected to generate over \$996,000 annually in new revenue. See Exhibit C.

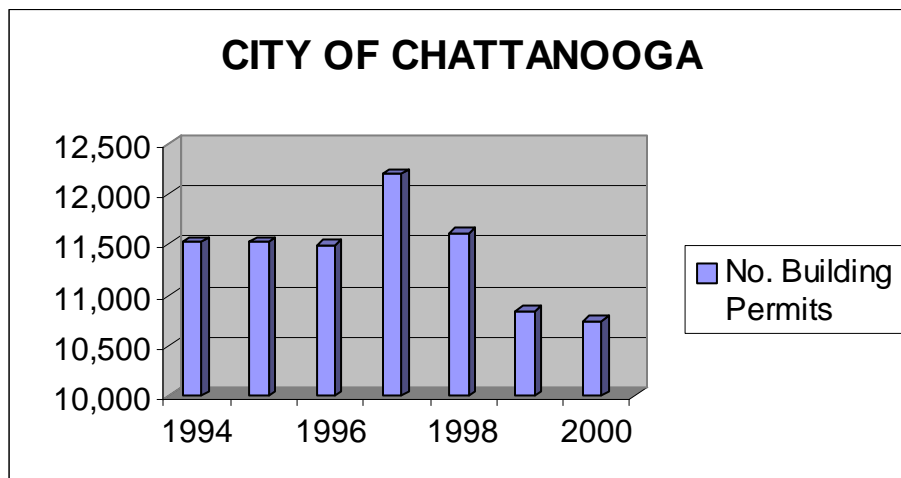


Figure 1

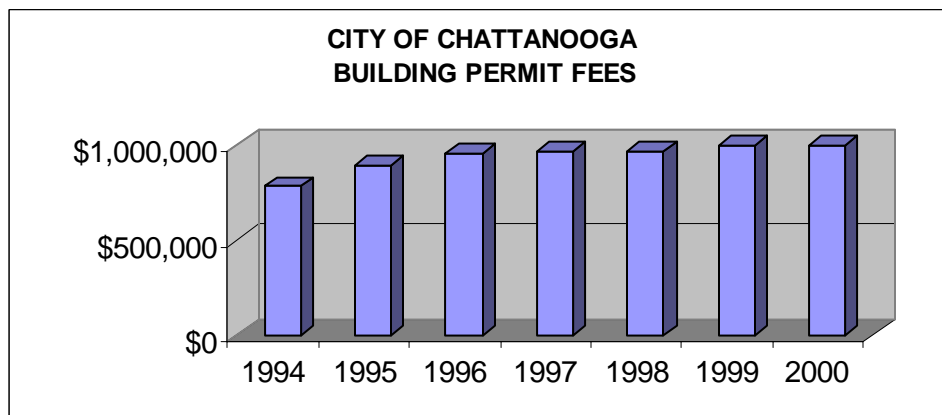


Figure 2

## Division Work Activity

Figures 3-6 present information about the number and types of construction permits issued during recent years. Figure 3 shows that while the number of building permits has grown since 1997, gas, mechanical, plumbing and electrical permits have either fallen or remained flat.

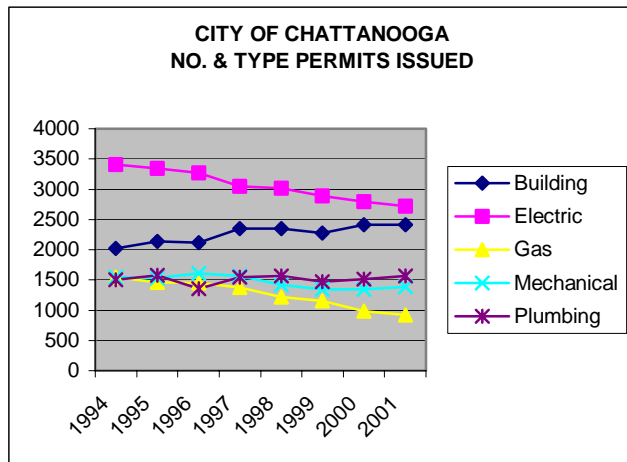


Figure 3

Figure 4 shows that street cut, signs, landscaping and stormwater permits have remained flat or decreased in recent years.

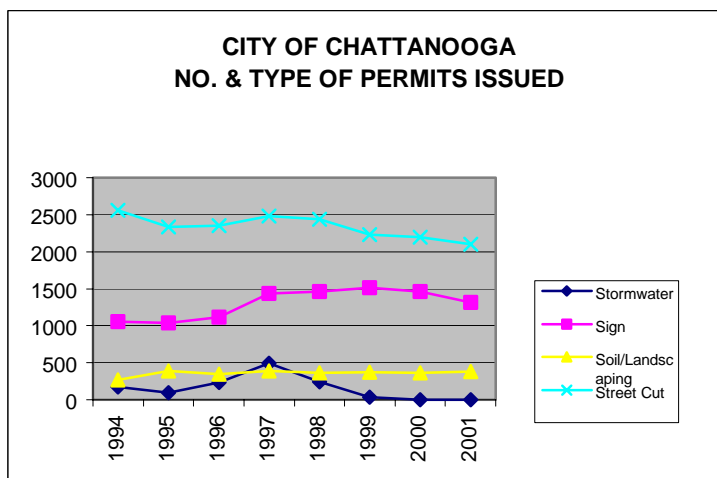


Figure 4



Figure 5 shows that the majority of the work load for the division is derived from 1 & 2 family residential construction – both new construction and additions and alterations.

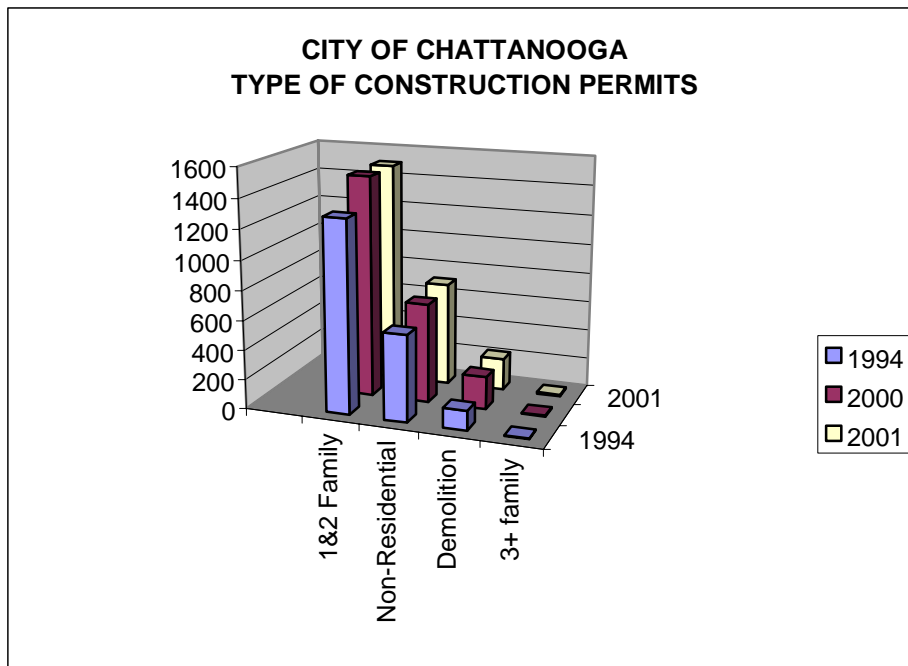


Figure 5

- 1&2 family construction– includes one and two family dwellings, mobile homes and moved or relocated structures. This includes both **new** construction and **additions and alterations** of one and two family dwellings and garages and carports. For instance, for FY 2001, 36% of the permits in this category were for **new** construction and 64 % were for **additions/alteration, relocations and mobile homes**.
- Non-residential construction – includes motels, institutional, churches, stores, hospitals, service stations, offices, banks, professional buildings, stores, schools, amusement, recreational, industrial buildings and other types of non-residential construction. This includes both new construction and additions and alterations of existing structures. For FY 2001, 28% of permits in this category were for new construction and 72% were for additions and alterations.
- Demolition – includes demolition of all structures both residential and non-residential.

- 3 + family construction – includes all residential construction (both new and additions/alterations) larger than two family dwellings.

For FY 2001, the activity of the codes and inspection division was divided between 1&2 family residential, 3+ family residential, non-residential and demolition as shown in Figure 6.

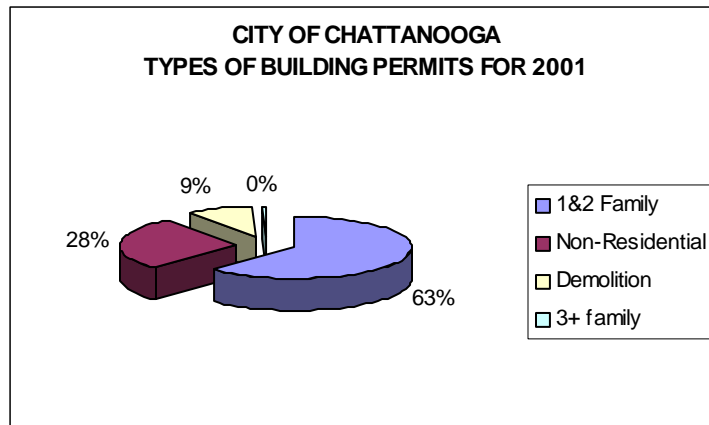


Figure 6

## Plans Review

The division offers pre-submittal meetings where engineers, architects, developers, contractors, and/or owners can meet with plans reviewers (engineering, traffic, landscaping, urban forestry, sanitary sewer, stormwater, and codes). The purposes of the meetings are to provide information to expedite projects. Applicants are encouraged to ask questions and get clarification before project submittal. Pre-submittal meetings are held twice weekly.

The number of individuals who review a set of plans and the amount of time spent in review varies with the complexity of the project. One and two family residential plans generally consist of a site plan only. Construction drawings are not required. Generally, the residential site plan should show: name, address and phone number of the owner, developer/contractor, boundary lines, lot dimension, adjacent street names, setback distances between new construction, property lines and other structures on the lot, building dimensions and property relationship to streets.

One and two family residential plans are reviewed by engineering to ascertain address, zoning, flood plain status, stormwater and traffic impacts (for developments) and sewer availability. Generally, this review is completed in a few hours to a few days.

Things that could slow or stop such projects are lack of sewer availability or zoning restrictions.

Commercial, institutional, industrial and three or more family residential plan review is more complicated. If proposed construction is intended for assembly (50 or more people), educational/institution occupancy, if the structure is three or more stories and/or if the structure's floor area is 5,000 or more square feet, then plans must be prepared by a design professional (an architect or engineer).

During the last few years, the city has had some multi-million dollar building projects. These type projects require detailed, time intensive plan review. The goal of the division is to complete reviews in the following time frames:

- engineering review (zoning, 100 year flood elevation, address, ownership, sewer availability) = 2 days
- environmental reviews (stormwater, landscaping, urban forestry, traffic, sanitary sewer, curbs, gutters) = 10 days
- building/life safety reviews (compliance with life safety codes, fire, mechanical, electrical, plumbing and signs) = 6 days

Problems with plans and heavy volume workloads can and do deter the division from meeting its goal. However, the turn around times noted above are typical for most plan reviews. Recall that plumbing, electrical, gas and mechanical staff review plans for construction in their zones as well as perform field inspections.

Table 1 shows the applicable code and positions involved in plans review for non-residential projects and 3+ family residential projects. *11-14 different reviewers conduct the typical non-residential plan reviews.*

Table 1  
*Non-Residential Plans Review*

<i>Type of Review (Applicable Code)</i>	<i>Position Involved</i>	<i>Total # Permits Issued – FY 2001</i>
1999 Standard Building Code	CC	
1997 Standard Plumbing Code	CC, PI	
1997 Standard Mechanical Code	CC, G/MI	
1997 Standard Gas Code	CC, G/MI	
1999 National Electrical Code	CC, EI	
1997 Life Safety Code	CC, FM	
1995 Model Energy Code	CC	
1995 Chattanooga Zoning Ordinance	Engr. - zoning, CC	
Local Landscaping Ordinance	Landscape	
Local Urban Forestry Ordinance	Urban Forester	
Local Stormwater Ordinance	Engr. – stormwater	

Local Signs Ordinance	SI	
Local Sanitary Sewer Ordinance	Wastewater	
Local Traffic Ordinance	Engr. -Traffic	
<b>Total</b>		484 (see Exhibit B)

CC = Codes Coordinator; FM = Fire Marshal; PI = Plumbing Inspector; G/MI = Gas/Mechanical Inspector; EI = Electrical Inspector; SI = Signs Inspector

## Inspections

In addition to plans review, each project - residential and non-residential - requires field inspections by various staff. Again, the number of field inspections required varies according to the complexity of the project, field conditions and skill of the developers/contractors. *Typical residential projects require 11-14 (depending on type of construction – slab or no slab) different inspection visits by 4 different inspectors (building, electrical, plumbing, gas/mechanical).*

*Typical non-residential construction requires 19-22 different inspections by up to 8 different inspectors (building, electrical, plumbing, gas/mechanical, signs, stormwater, landscaping, traffic).* In general the following types of inspection apply as shown in Table 2.

Table 2  
Existing Inspections Program

Type of Inspection	Building Inspector	Plumbing Inspector	Electrical Inspector	Gas & Mechanical Inspector	Signs Inspector
Zoning	•				•
Temporary Electric			•		
Footers	•				
Floor Joist or Slab	•	•	•		
Rough-In	•	•	•	•	
Insulation	•				
Final	•	•	•	•	•
Close-out	•				
Number of Inspectors	*5	4	4	2	*3

\* includes chief inspectors

Inspectors document their activities via use of hand written reporting forms. They communicate with owners/contractors/developers to schedule appointments, answer technical questions and provide general information.

### **III. FINDINGS**

The division has an experienced, dedicated staff that appears very interested in doing their jobs well and rendering a good service to the residents of the city. However, they are hampered in service delivery by system problems. We identified system problems in the areas of efficiency/effectiveness, customer service, organizational structure, leadership and technology. Each topic is more fully explored below.

#### **Efficiency and Effectiveness**

From our observations of the way work is processed, from our conversations with customers and from our knowledge of work processes in similar municipal operations, it appears that the Division of Codes and Inspection could better utilize its work force. The following identify efficiency and effectiveness concerns:

1. The plans review and approval process, as it currently exists, is inefficient. It is too slow, un-coordinated and un-documented. Submitted plans go to three different physical locations and are handled by at least 11 different reviewers. An average turn around time of 18 working days was reported. If reviewers encounter serious problems, the review time increases.

Perhaps a greater problem with plans review is communications. Communications within the division, between other divisions within public works and with other departments (such as the Fire Marshal) and with the owners, contractors and developers does not flow smoothly. For instance, a contractor inquiring about the status of plans approval may have to talk to several reviewers to ascertain the status. Also, the person submitting plans may be contacted by up to 14 different reviewers requesting additions/revisions. Lack of an adequate tracking system and a centralized communications link to the owners/contractors/developers causes confusion and wastes everyone's time. It also invites finger pointing and blame. Several persons gave examples of plans that were "approved" by review staff, but when actual work was constructed in accordance with approved plans, inspectors rejected the work. These instances

cause costly delays and rebuilds.

2. Inspectors should be used more effectively. Using multiple inspectors (building, electrical, gas/mechanical, plumbing) on both simple (usually residential) and complex (usually commercial) projects generates more trips by more inspectors than necessary if combination inspections were performed. If inspectors were certified in more than one discipline and cross-trained, they could perform combination inspections on the same visit for residential projects. Inspections as currently configured require a builder to coordinate with 4-8 different people for inspection visits at various intervals during the construction.
3. Lack of a reception area/waiting area and lack of a receptionist to greet and route walk-in customers invites and allows interruptions of all staff at all times. While being available to the public is generally a good idea, allowing unscheduled, walk-in disruptions does not allow the director, plans reviewers and inspectors time to plan, concentrate and complete work in an effective manner.
4. Lack of written, clear, concise how-to guides about the division's procedures cause staff to answer numerous, repetitive, routine questions from homeowners, developers, contractors and professional designers. Step by step guides and frequently asked questions (FAQ) if available on the division's website and via informational packages could save staff time and render better customer service.
5. Incomplete plans are accepted. Specifications may or may not accompany the plans. Acceptance of piece-meal and incomplete plans and specifications and assistance by staff in plans development requires more follow-up by staff than necessary if only complete submittals were allowed.
6. Inspectors do their own plan reviews (for electrical, gas, mechanical and plumbing). They often do not have complete specifications. Lack of information and time constraints on review; result in inspectors not catching problems during the plans review process about 5% of the time. This can result in costly corrections during field inspections, not to mention the customer service problems.
7. Lack of electronic permitting and payment capabilities as well as lack of fax permits and credit card payments creates more walk-in traffic and causes customers more processing time than necessary.
8. Lack of written review comments causes problems. During the approval process, reviewers make notes on two sets of plans. One stamped set of "Approved" plans is returned to the contractor at the end of the approval process; the division retains one stamped approved set. Contractors build projects according to plans and specifications prepared by design professionals. Often, the design professional (architect or professional engineer) may not be aware of staff review

comments noted on the plans. Contractors often cannot interpret/follow review comments.

9. Lack of electronic inspections reporting capabilities wastes time particularly for inspectors and clerks. Clerks now generate a permit field card; inspectors use the permit field card and calls for service to generate inspection visits where findings are documented on handwritten daily field logs; clerks then enter daily field logs into an electronic database. In addition, the large number of cases inspectors have open at any given time (100-250) causes a records management problem considering the files are manual.
10. The 80/20 rule operates in this division. 80% of the division's effort seems to go toward 20% of the workload and problem resolution. There does not appear to be any distinction between big and small priorities. Reviewers spend a disproportional amount of their time handholding small low dollar projects that are not professionally prepared. The result is too much time expenditure with small projects and too little time with large projects.

## **Customer Service**

This division does not have a system to track customer complaints (except zoning complaints). Therefore, several customers, including design professionals, residential contractors, commercial general and specialty contractors and trade associations were interviewed for their assessment of services rendered by this division. Interviewees stated that this division does not compare well with other comparably sized cities in which they have done business. The overall assessment by those customers interviewed:

***This division is a typical bureaucracy. Service is average.***

Individual staff was cited as rendering very good customer service; others were cited as being too slow or too heavy-handed in responding to customers. Several customers mentioned that the lack of procedures, lack of clear lines of communications and lack of consistency in customer relations were primary problems. Here are representative remarks pertaining to customer service:

*Staff is cooperative and provides good customer service.*

*Plans review takes too much time, and the process is too confusing.*

*Inspectors throw their weight around; they talk down to contractors.*

*Inspectors are not available by phone in a timely manner. Scheduling inspections is a real hassle.*

*The staff does not present themselves in a professional manner including business attire.*

*It is very frustrating to have to make several phone calls to different people to find out the status of my projects.*

*It's very confusing to work with this division. It's too fragmented.*

*Staff does not really understand who their customers are.*

*Customer service is not consistent. Big projects have to meet tougher standards than do small projects.*

*Lack of procedure and poor lines of communications with customers create problems.*



## Organizational Structure

As with any unit, department, or city government, organizational structure is critical to that entity being able to effectively and efficiently fulfill its' purpose. That doesn't mean the entity's purpose cannot be achieved regardless of the organization. But, can it be done in an effective and efficient manner? The following organizational structure findings were identified.

1. There is not an assistant's position to the Director of Codes and Inspection. This results in the director handling all of the day to day arbitration of code disputes between inspectors, serving as the ultimate customer service representative for the division, being the division's representative for most inter-departmental relations and managing the department's improvement efforts and movement into the future. It is too much for one individual.
2. The lack of an assistant results in the chief building and zoning inspector being elevated to the role of acting director during the director's absence for vacation, training, etc. Building inspections, as currently operated, is already short handed. This arrangement only compounds the situation.
3. The codes coordinator is responsible for all plans review, but actually supervises only one person. The remaining 10-12 positions involved in plans review are on a peer level with the codes coordinator. Therefore he can only function as a coordinator - not as a manager of plans review.
4. There is not a fixed procedure for plans review and it is left to the discretion of each chief inspector. Currently individual inspectors review plans for their individual work zones. The potential for inconsistency in review exists. The only saving point is the fact they all work for the director. However, this is not the case for external or environmental reviewers. Not only do you have the potential for consistency problems, but also all of the environmental reviewers work for other divisions or departments and are not answerable to the codes coordinator or the director.
5. Artificial barriers between inspection units limit production and are costly at least in residential inspection. The division is following the traditional structure built over many years. On any given residential project, at least 3 or more inspectors are making several individual trips to conduct the simplest of inspections on a residential dwelling. This requires the permit holder to coordinate with at least 3 or more inspectors, and results in triple costs for the department in some cost items, especially travel. It is acknowledged that two "combined" inspectors exist in plumbing (1) and electrical (1) and they are also certified in building codes. These inspectors actually do combined inspections, but only in times of overload activity for building inspections.

## Leadership

This is probably the most critical and sensitive issue that will be addressed in this study. It has long-term implications for the division. With proper leadership many of the problems noted in this study would not exist. They would have been identified and corrected. Without proper leadership many of the recommendations of this study will never be adequately implemented. Following are some findings of leadership deficiency:

1. Lack of vision. During the course of the interviews no one had a vision of where the division would be, or more importantly, should be in the next 5 years. No one has assumed responsibility for the vision “thing”.
2. Basic planning is completely missing. The study did not reveal any long or short-term written work plans, regarding any aspect of the department’s operation. Plans may be in someone’s head, and if so, the sharing of that work plan is non-existent. This is most amply demonstrated in plans review. The process improvements that have occurred have been the result of upper level management (outside the division) responding to a crisis or plans reviewers trying to “coordinate” improvements. Division leadership has been non-existent on the issue.
3. The division lacks a champion. Part of the role of a leader is to serve as the cheerleader and champion for their organization. To protect and fight for their people and their division’s interest. This is most clearly illustrated with two issues in the technology area. First, is the employee’s interest. The city’s recent changes in cell phones has apparently limited some of the inspectors to the point they have purchased their own Cricket phones for work use. The second more significant issue is the computerization of the department. There have been improvements over the past few years, but the possibility for major changes have been languishing between the division and Information Services for quite some time. Each side has “reasonable” excuses for why progress has not been made, but the bottom line is that the leadership in the Division of Codes and Inspection has failed to **plan** for the division’s technological needs and then to **champion** the implementation of that plan.
4. Team management exists only in the area of training and code interpretation. Management does coordinate and present training programs for staff and also coordinates on code interpretations. However, we found no evidence of the division managers meeting in regular management team meetings, doing anything in the area of long, or even short term, planning or in evaluating workload and possible reassignment of staff.

## Technology

This division handles a large volume of information. It is important to all staff, particularly to management, to be able to retrieve and use information to expedite work and answer customer questions. While several data centers are in use, there is no coordinated, comprehensive approach to data management. The following data centers are in use.

1. Public Works Permits (PWPE) – clerks accept paper permit applications from developers; enter permit information in the PWPE database; enter the results of inspection logs into PWPE; and maintain contractor licensing information (state and business) on PWPE. This database allows the user to generate reports on number and type of permits, permit fees, contract value, and the number of inspections associated with permit numbers.
2. A cash register system database is used to maintain records for the sewer payment plan. The sewer payment plan allows contractors to finance sewer laterals over five years. The division bills customers monthly. The division also bills outside utilities (water, telephone, gas and cable) for street cuts.
3. Environmental reviewers use an internal database to log actions and plan review comments. This database was created in the late 1990's, and is used to track status of environmental reviews only.
4. In addition to the databases mentioned above, all staff has voice mail and email capabilities. Field staff has the use of cell phones, but restrictions on time usage limits cell phone effectiveness.

Technology issues have been a concern in this division for many years. Staff realizes that:

- (1) they duplicate efforts by filling out paper inspection logs that have to be keyed into databases by clerical staff;
- (2) database entry is a low priority and often lags;
- (3) electronic retrieval of up to date information cannot occur;
- (4) there is no centralized tracking system that allows management to ascertain the status of a set of plans;
- (5) on-line access to code books with search capability would help expedite work;
- (6) e-permitting is not available to customers;
- (7) electronic plans submittal is not available to customers; and
- (8) limitations on cell phone usage by inspectors hampers efficiency.

It appears that several attempts have been made to study and resolve technology issues. Piecemeal solutions have been implemented as noted above.

However, there is no comprehensive approach to information storage, use and retrieval. Much division knowledge and history is only available orally.

## IV. RECOMMENDATIONS

### Organizational Structure & Leadership

Recommendations for the organizational structure and leadership are sweeping and possibly controversial. Practically all operations of the Division of Codes and Inspections are touched by these recommendations. Exhibit D shows the proposed organizational chart. Each recommendation and the justification for the same are as follows:

1. **Modify the position of Division Director to become a position of management and leadership and recruit to fill the newly modified position.** The Division of Codes and Inspection needs a division manager, and it needs a leader. It needs someone to look beyond the day-to-day inspections function, to implement some basic team management principles and to begin a strategic planning process for the division. This person would not have to be a technical expert, and he/she should not be involved in the day-to-day minutia of the division.
2. **Create a position of Assistant Director for Plans Review and recruit or promote to fill the new position.** Considerable discussion has been devoted to the lack of consistency, communications and cohesion in the plans review process. Much of that is attributable to the number of people involved in the process (11 to 14 different people are involved with any given set of plans) and the “coordinating” versus managing role for plans review administration. In addition to resolving customer service problems, this person would manage the pre-submittal meetings, the plans review process and would resolve technical problems. The current position of plans coordinator would be eliminated.
3. **Create a customer service position for plans review. This person would be responsible for checking submittals for completeness, logging plans, finalizing the plans review notes and serving as the initial single point of contact for customers regarding status of plans.** Currently one or more reviewers and someone in engineering are logging in plans. This needs to be

reduced to one centralized point and one person performing the function. Also the current practice on review notes is that they don't exist, at least not in a typed and attached format. Instead they are handwritten on the plans themselves. Finally customers are passed from one reviewer to the next until they reach the person currently reviewing their plans and in a position to provide them a status on the review. All of this would be corrected with the customer service position.

4. **Consolidate the building/life safety reviews and provide 3 full-time reviewers.** Staffing for these 3 cross trained reviewers would come from the office of codes coordinator, the electrical inspections unit and the plumbing, gas and mechanical inspections unit. These 3 positions would do all of the building/life safety reviews plus the signs plans review and would have minimal contact with the public and absolutely no contact with the public unless they have a set of plans under review and that contact would be controlled by the customer service position. These reviewers would have no inspection responsibilities. This recommendation should enhance the consistency and quality of the reviews.
5. **Place the 5 environmental reviewers (engineering (traffic and zoning), sanitary sewer, stormwater, landscaping and urban forestry) under the Assistant Director for Plans Review and retain their inspection function in addition to their plans review function.** This is a critical step in “managing” versus “coordinating” the plans review process. Staffing for these 5 reviewers would come from the existing environmental reviewers. These 5 positions would do all of the environmental review and inspections and would have minimal contact with the public during the review process. We are certain that 5 reviewers/inspectors are adequate to do the job and to provide back-up reviewers when the office is short-handed due to volume of workloads, vacation leave, etc. In fact, with cross training some of these functions might be combined and the number of environmental reviewers and inspectors might be reduced. For example, stormwater might be combined with either sanitary sewer or landscaping or both. There is also the possibility of cross training between some of the environmental inspectors and the building/life safety inspectors i.e. plumbing and sanitary sewer. This still leaves the Fire Marshal's office out of the loop. Better communication, routine interaction in the pre-submittal meetings and providing the Fire Marshal an outpost office at the division would enhance this portion of the review process.
6. **Create a position of Assistant Director for Inspections and transfer the current Division Director to that position.** If the director is required to manage and lead the division and an assistant director's position is provided for plans review, then a comparable position for inspection is both logical and necessary. This position would be the ultimate arbiter of all conflicts regarding code interpretation, the manager of all codes training and the division's lead person for codes inspection. This position would be the lead position and/or manage the division's interaction with all trade association, all licensing and testing and all representation with appeals boards, including Board of Zoning Appeals.

7. **Create a customer service position for inspections. This person would serve as the initial single point of contact for all inspection customers regarding status of inspection, etc.** Currently customers interact with anyone they can come in contact with including the director. With this position the public contact would not be prohibited, but it would be managed and controlled. This position would assist the inspectors in the development and finalization of their inspection reports and over time, depending on the technological developments for the division, would assist the inspectors in setting their inspection schedules.
8. **Create or broaden the position of combined inspector to cover all residential related inspections (building, plumbing, gas, mechanical and zoning) and sign inspections.** This would allow one position to be certified in all of the above areas and to provide all inspections that relate to new residential and residential add ons and alterations. Residential inspections are the simplest and combination inspectors are the norm in smaller cities, and they are not uncommon in larger cities. Each of these inspectors would have an assigned territory and be responsible for related inspections within their area. This could include such items as periodic video taping of all signs within the City.

Although these inspectors will have to be paid at a pay grade that will encourage them to become certified in multiple disciplines, they also offer many benefits. Long term there will be cost benefits. Logistics (the travel back and forth to the construction site) will be minimized and should be reduced by at least two thirds. The cost of the actual inspections should be reduced somewhat, although this may be a marginal savings. The customer service benefit to the builder should be substantial, because the builder will deal with only one city inspector from the temporary electric to the certificate of occupancy. For example, rough-in inspection would be prepared and conducted for building, plumbing and electric at the same time. The division would need 10 combination inspectors as shown in Table 3. This number may be reduced if inspection districts are drawn well and some of the technology recommendations are implemented. This recommendation would also eliminate the current chief of signs inspection position.

Table 3  
Proposed Inspections Program

	<i>Non-Residential</i>				<i>Residential</i>
Type of Inspection	Building Inspector	Plumbing Inspector	Electrical Inspector	Gas & Mechanical Inspector	*Combined Inspector
Zoning	•				
Temporary Electric			•		▲
Footers	•				▲
Floor Joist or Slab	•	•	•		▲
Rough-In	•	•	•	•	▲
Insulation	•				▲
Final	•	•	•	•	▲
Close-out	•				▲
Number of Inspectors	2	2	2	1	10

\* Includes all building, plumbing, electrical, gas/mechanical, zoning and sign inspections

9. **Place the combined residential inspection unit under the Chief Building Inspector and reduce the number of inspectors for commercial and industrial building inspection to 2.** The Chief Building Inspector (CBI) would have a greater number to supervise and probably should be compensated more than the other chiefs. He/she would also be the initial arbiter of building code conflicts and would assist the commercial inspectors with complex problems. The CBI and/or the assistant director would also be the division's representative in environmental court. The CBI and/or the customer service position would also be responsible for developing the compliance letters for this unit. Finally the CBI would be the lead person for training within the unit.
  
10. **Reduce the number of commercial and industrial electrical inspectors to two and place them under the Chief Electrical Inspector (CEI).** These inspectors would only do commercial and industrial inspection. They would not do plan review. They, along with the CEI, would do all plant return inspections (inspecting the work of plant in-house electricians, which the department is falling behind in doing). In addition, the CEI would be responsible for helping the assistant director in training and in the licensing and testing for electrical

licenses. The CEI would also be responsible for helping the assistant director with all associated board (appeals) relations and trade association work. The CEI and/or the customer service position would also be responsible for developing the compliance letters for this unit. Finally the CEI would be the lead person for training within the unit.

11. **Reduce the number of commercial and industrial plumbing, gas and mechanical inspectors to 2 plumbing inspectors and 1 gas and mechanical inspector and place them under the Chief Plumbing, Gas and Mechanical Inspector.** These inspectors would do only commercial and industrial inspection. They would not do plan review. In addition, the chief would be responsible for helping the assistant director in the licensing and testing for their respective trade licenses and in training and all associated board (appeals) relations and trade association work. The chief and/or the customer service position would also be responsible for developing the compliance letters for this unit. Finally the chief would be the lead person for training within the unit.
12. **Reduce the Office Manager's staffing to the manager and 2 permitting positions.** With the creation of the customer service positions in plans review and inspections, this office would focus exclusively on permitting, collections and record maintenance and storage. This office or the office manager would also service as staff for the division director.
13. Reconfigure office design for the new location to accommodate the proposed organizational structure discussed above and shown in Exhibit D. It's important for assistant directors and customer service representatives to have offices near their staff. This facilitates communications and teamwork.

## **Technology Issues**

1. **Procure technology (software and hardware) that will accommodate data management, storage and retrieval for all aspects of codes and inspection activities.** This will require a comprehensive evaluation of the division's operations by a computer systems analyst and development of specifications before beginning the procurement process. Familiarity with data management systems in use in other municipal codes and inspections operations may be helpful. A number of other cities across the country have purchased and/or developed data management systems for their codes and inspection operations.

The City of Chattanooga's information systems department did some work on evaluating the Division of Codes and Inspection needs in 1996. The 1996 evaluation is a good starting place. Also, the division has had demonstrations by at least two software vendors in recent months. A word of caution – it is unlikely that the division will be able to find an “off the shelf” software system that meets all their needs. Mostly likely, any software system will have to be customized to meet needs.



Features of a data management system may include:

- (1) the ability to receive electronic plans and specifications from customers;
- (2) the ability to log, respond to and track plans and inspections via project number;
- (3) the ability for multiple users to access and respond to electronic projects;
- (4) the ability for customers to read staff comments and status electronically;
- (5) the ability of inspectors to receive, log and transmit project information electronically from the field;
- (6) the ability to integrate permitting, plans review and inspection data in an integrated system; and
- (7) the ability to provide various management reports on division operations.

Exhibit E provides information on data management systems in use in other systems. Notes and highlights on the exhibit point to features the city's division may consider.

2. **Procure technology and equipment to expedite communications between customers and inspectors.** Interactive voice response system is a system in use in several cities. This system understands voice commands and allows contractors to request, reschedule and cancel inspections, retrieve and listen to inspection results, trade messages with inspectors or request faxed material. Building inspectors can retrieve information about a project and file inspection reports via cell phone from the field. More information on this system is shown in Exhibit E.

In addition, the division cell phone needs should be revisited. The current plan does not allow enough local usage time per user without incurring penalties. A plan commensurate with the needs of field personnel should be acquired.

3. **This division needs a stronger web presence.** If technology is acquired that allows users to conduct business via the Internet (electronic permitting and payment, electronic plans submittal and tracking, etc., this comment will be partially satisfied). However, public information that could be placed on the division's existing web-site could and should be developed as soon as possible. How-to information and frequently asked questions (FAQ) on the web could be used now to provide better customer service. See Exhibit E.

## Other

1. **Revisit and modify the pay structure in the Inspection Division.** In addition to having to classify and create pay ranges for the new positions of assistant director and customer service position, there will be a need to create job descriptions for combined plans reviewers and for combined residential inspectors. As stated earlier these combined positions will need a pay structure

that provides an incentive for regular inspectors to become combined inspectors. Such a pay incentive will need to be more than has been either considered or used in the past.

2. **Use a courier service to transfer money from remote location to city hall. Alternately, allow staff to deposit collections at Am South Bank located adjacent to remote office.** Although the distance between the new facilities that will house the division and City Hall is only 2 to 3 blocks, the potential risk for staff carrying deposits to City Hall still remains. Either option will mitigate this risk.
3. **Require and use a checklist (that includes specifications) to determine if plans submittals are complete. Do not accept incomplete plans.** Certain items should be contained in each set of plans and if the set is deficient, then the plans should not be accepted. In essence, deficient plans should never be logged into the system. This consumes time and wastes time.
4. **Plans review comments should be in typed format and should be an attachment to the plans. They should also be provided to the owners, designers and contractors.** As noted earlier, plans review comments should be compiled in written format and attached to the plans. The current practice of hand writing the notes on each set of plans is time consuming (work duplication), may cause quality variances and limits the number of copies of notes to the number of sets of plans. If copies of the notes are made available to all participants (owner, designer, and contractor), then everyone with a vested interest is made fully aware of the problems with a set of plans (or lack thereof) before construction commences.
5. **Discontinue/reduce conditional zoning approvals.** Conditional zoning adds another layer of record keeping and information that must be ascertained with each modification or transaction that occurs with a given piece of property. There are circumstances in which it may be beneficial, but the extent of its current use, may be exceeding its benefit. We recommend discussions between the administration, the city council and the Regional Planning Agency regarding the purpose, benefits, use and costs of conditional zoning.
6. **Take steps to professionalize the image of the division.** Provide uniforms or establish a dress code for inspectors that identify them as inspectors for the City and enable them to make a professional presentation. Develop and provide training programs that focus on customer service and professional imaging.
7. **Add renovations/additions over \$25,000 to the list of requirements that must be professionally prepared.** Extensive (to be defined) modifications to existing commercial or industrial building should require design by an architect or design engineer. The loophole that is currently in place allows a business to almost double its size from 5,000 square feet (requires an architect or design

engineer) to 9,900 square feet without an architect or design engineer (anything less than 5,000 square feet does not require an architect or design engineer).

8. **Require pre-submittal meetings for first time users of the plans review system (including large non-private users such as the City or UTC).** The success of the pre-submittal meeting is such that it should be required of all first time users. Testimonials by staff and users offers convincing proof that these meetings save time and money and helps avoid a lot of needless frustration.
9. **Zoning ordinance codification.** The zoning ordinance is a document that is used daily and is amended almost every month. Without an up to date ordinance, the staff in both plans review and inspections are doing time consuming cross checks to be sure the section of the zoning ordinance they are reading is correct and has not been amended. It is unavoidable to have an out of date zoning ordinance, but it should only be out of date by a couple of months and not a couple or more years. A couple of months is easily cross checked, whereas, a couple of years or more takes considerable time to cross check and any given individual could always be concerned that a particular section of the ordinance was not current.

