Final Report

Storm and Sanitary Sewer Issues

Boone, Iowa

October 9, 2008

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October 9, 2008

Luke Nelson
City Administrator
Boone, Iowa

Dear Luke:

Having completed our evaluation of significant storm and sanitary sewer issues in the City of Boone, we respectfully submit our findings and recommendations.

Our approach sought to determine the prime causes of the sewer problems. We then met with various vendors, City agencies and governmental agencies that could provide us with insight and clarification of the issues.

Each of the issues has many facets, and many ramifications that need to be considered to determine a comprehensive set of solutions. Each of the solutions, also, have many sides and several subtle details to be considered when the proposed recommendations are studied.

All of the issues have solutions. None are without resolution. In the past, however, it appears that there was a diversion of funds and resources to other facets of the City Government, allowing the sewer systems to continue to deteriorate.

Concerning financing, we have presented some possibilities, but most strongly recommend that a team of Boone residents (perhaps a standing committee) with expertise in the banking, finance and investment areas be assembled. Their expertise in this arena would far exceed what this AAC is able to offer.

You must continue to get the citizens involved. It appears that they are going to need to open their purse strings to get this problem resolved and get the city into a proactive mode of operations regarding storm and sanitary sewers. They are not going to do that unless they clearly see the need and understand why the finances are required. They must also be assured that the money is being spent for the right things. The verbal "dancing" must stop and issues must be addressed directly and literally with no margin for misunderstanding or misinterpretation. Clear, concise communication in a language commensurate with the background and education of ALL of the general public must become the order of the day. A publicity campaign with an on-going information dissemination program would definitely be in order.

It seems to be the tendency of citizens in general to believe the worst of any form of government. Our City is not exempt from this phenomenon. We are all quick to judge and assume the worst. For instance, two people in a truck is a bad thing, tearing up the underpass when burying sewer pipe is just a few weeks away is a bad thing, etc.

Knowledge is power, depending on how it is applied. Give the people the knowledge, and when you ask for power (money) to do something, you stand a much better chance of getting it!

The AAC unanimously thanks you for this opportunity to be part of the decision making process in this major problem area. Our duties have not been taken lightly. We have made every effort to validate, corroborate and substantiate the information provided to us. We are aware that our involvement will not end with the publishing of this report, but will extend far beyond our two month assignment. We will continue to promote and encourage citizen involvement in similar teams and studies in the future. Some of these many opportunities are enumerated in section four of this report.

You will see some of your thoughts and ideas presented here, supported and expanded where the AAC felt they should be included. You will also see that we disagree with others. That's life in the big city.

We also thank you for your support and assistance in contacting and arranging for people for us to interview. In addition, your candid sharing of free access to data and records was greatly appreciated and made a major contribution to this AAC, not only in knowledge, but in our attitude and approach to the issues.

Should any of the information in this report need clarification, please do not hesitate to ask. There are members of the AAC that would welcome the opportunity to speak directly to you or the City Council on any or all of these issues.

Sincerely,

Bill Sharp, Chairman, Administrator's Advisory Council

Glenda Lass | Virgil Lass | Steve McCoy

Chris Miller | Joe Pundzak

Dr. Wayne Rouse | Mike Tungesvik

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Final Report
On

Storm And Sanitary Sewer Issues

Prepared For

Luke Nelson
City Administrator
Boone, Iowa

By

The Administrator's Advisory Council

October 9, 2008

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1. AAC (Administrator's Advisory Council) Development

This AAC, being the first of its kind in Boone, was given considerable leeway in determining its course of action and expected outcome. Virtually no area, pertaining to the broad scope of this activity, was untouchable. At the organizational meeting, basic information was provided and the Original Task Summary, shown below, was presented. The AAC was then left to define its own destiny.

1.1 Original Task Summary

To provide a report of findings/action to the City Administrator regarding sewer improvements.

1.2 AAC Charter

The following charter evolved over time as the AAC recognized the wide variety of issues that needed to be included in the study. This charter was then adopted to provide direction and continuity for the AAC.

Use a structured approach to define issues regarding storm sewers and sanitary sewers. Provide guidance in the resolution of those issues through prioritization of projects and recommendations for action by the city. Where possible, provide recommendations for the attainment of finances and resources to accomplish these resolutions.

1.3 AAC Evolution

The charter provided needed direction. However, there was still a tendency to expand the process to encompass areas that are best left to future studies. To further focus our efforts, the AAC adopted the following set of guidelines pertaining to the storm and sanitary sewer issues in Boone:

- **Do not make a bad matter worse.**
- **Define root cause of problems.**
- **"If it ain't broke, don't fix it."**
- **No action without a plan.**

With those thoughts in mind, the AAC proceeded to survey various vendors, City agencies and governmental agencies to determine the storm and sanitary sewer issues facing the city and how they could be resolved. Other sources were also utilized to provide clarification and corroboration of information. See Appendix A.

2. Executive Summary

"By trying, we can easily learn to endure adversity -- another man's I mean."
Mark Twain

This summary is provided to give an overall view of the AAC process as well as generalized recommendations. The very nature of this study led the AAC down convoluted paths that led to conclusions that are, themselves, much more involved than they would appear on the surface.

2.1 Logical Process

The process used to determine recommendations was one of caution with expedience. The objective was to gain as much knowledgeable as we could by consulting with and questioning the experts in each of the fields that we felt required examination prior to making a judgment call. We also had the opportunity to review a wide variety of documents and studies directly related to the following core problems:

- **Raw sewage backing up into the basements of City residents.**
- **Property damage caused by storm water flooding.**

To accomplish this, the AAC met twice a week during the allotted two month time frame.

In addition, several seemingly unconnected areas of concern were discussed and debated. Some of these areas are included in section four of this report. Although these areas may seem unrelated, their significance is recognized when consideration is given to the amount of money and resources that will be required to get the infrastructure, the very foundation of our City, back to a fully operational state and keep it there.

Although this team was not financial in nature, we took the liberty of recommending future studies in areas that we felt could be gleaned for badly needed funds and resources.

2.2 General assumptions

No area or source of information was considered sacred. If the AAC felt that knowledge was required in any area, we requested the information and it was provided quickly with no questions asked. We encountered no "hidden" areas.

We spoke with several knowledgeable people in a variety of disciplines and rarely met with resistance or reluctance to share information except as noted in the body of this report.

Great pains were taken to assure that we had the best information to deal with and minimize assumption at every opportunity. This, in itself, was no small task. It seems that rumors and misinformation run rampant and sorting fact from fiction can often require more time than expected. However, the rewards of taking the time to corroborate data and information are great when the consequences of using bad information to make decisions are realized.

2.3 Broad recommendations

The recommendations given in this summary are presented in the broadest and most general terms. A much more comprehensive discussion of each suggested solution is included in the body of this report.

The AAC felt that we would be acting completely irresponsibly if the first and strongest possible recommendation was not to put a **permanent qualified** moratorium on all new construction projects within the City. This includes remodels and modifications, as well. Areas of the city could be released from this moratorium as it is determined that new or modified construction in that particular area was fully scrutinized to assure that there was a very minimal chance of it making a negative impact on the sanitary and storm sewers in that area, adjoining areas or other areas down stream. The term **"permanent qualified"** may appear to be a **dichotomy**, but the reader is strongly encouraged to study section three of this report to fully understand the **positive consequences** of this recommendation.

The prioritization of the three water studies is Northeast Boone first, Lowell Park second and then Corporal Roger Snedden Drive. Some serious concerns about these studies were brought to light. Extreme caution in using these studies is strongly recommended.

A maintenance program must be established for the City that is comprehensive, affordable and perpetual. This is definitely not a "one time" happening. It must be recognized that other recommendations affect this maintenance program and must occur simultaneously for the City to recover from the situation that has developed over the past several decades. It is recommended that the City adopt and implement a GIS (**Geographic Information System**) that will allow for the retention of data to be used for not only sewer system maintenance and construction, but will include data for storm sewer, streets, water distribution, traffic, fire and police activity as well. In short, any data, concerning the city, that needs to be tied to a specific location.

In conjunction with the implementation of the maintenance initiative, a program to minimize and/or eliminate the influx of storm water into the sewer system must be launched. This program will involve the homeowners and include, among other things, sump pumps, roof runoff and water from periphery tile surrounding the homes.

2.4 Cost Considerations

Where applicable, or where the AAC felt they were qualified, costs are included with each project in section three. There is also a section dealing with financing and funding availability in section four. In several cases, the implementation of one program would decrease the need for finances for other programs. Where it was felt to be applicable, these areas are delineated in the recommendations.

There are existing line items for Sanitary and Storm Sewer service on the utility bills. The use of these sources to provide additional funds needed immediately to get many of these programs started will likely be required. It is our understanding that funds collected for a specific utility must, be spent only for those utilities. Clear and concise communication to the citizenry is imperative.

2.5 Caveats And Cautions

The AAC cannot emphasize too strongly that the reader must understand the entire set of recommendations due to the fact that none of them stand alone. All are dependant on others to assure their success. It is strongly recommended that this report first be read for content and then studied to carefully glean the details.

Throughout this process, a reoccurring concern is that the position of the City Engineer is contracted from the same firm that has undertaken many of the major studies and projects for the City. The City needs to review this policy. With the City Engineer providing oversight for the firms doing the studies and projects, it does not appear that they should be overseeing themselves. We have not observed any checks and balances with this relationship. The City Engineer should be from a firm separate from those doing studies and projects for the City. The current relationship is tantamount to having the fox guarding the chicken house.

It must be noted that information was gathered from many sources. Documents and interviews with government offices, vendors and City personnel provided the facts, data and statistics used by the AAC. We took great pains to corroborate and validate information as time would allow. However, in some instances, information was taken at face value and conclusions were drawn.

The conclusions, opinions, inferences and corollaries expressed in this report are our own and may or may not agree with others.

3. Recommendations and Prioritization

As the AAC increased their knowledge base and expanded their perception of the issues, it became clearer that an eclectic approach would be required to sort the many possible solutions into a comprehensive package of recommendations. However, this approach neglected accountability for many serious issues. Therefore, to deal with these issues, many of these recommendations have several facets that must be dealt with in their entirety to achieve the desired result.

Recognizing the frail condition of the sanitary sewers in this City, the application of the axiom "do no harm" would seem to be imperative. However, when we studied the Nilles Associates report entitled "Sanitary Sewer System Plan of Action City of Boone" dated June 15, 2005, we found that the City has known that all of the sewer lines from the wastewater treatment plant to the northeast corner of the city were full beyond capacity at that time. This information was clear for all to see and was verbally presented twice to the City Council, first in July 2005 and again in July 2007. In spite of this knowledge, and with apparent blatant disregard for the wellbeing of the citizenry that would be affected, the City allowed two major multi-family dwellings to be constructed in this known problem area, overloading a fragile sewer system beyond its breaking point. When this was discovered, it was decided that a mandate was required to force the City Council to police their own actions and put the citizens first when making these decisions, rather than acting on supposition, misinformation or lack of information.

3.1 Permanent Qualified Moratorium On All New Construction

A major concern of this AAC was to halt activity with a negative impact on the sewer systems. It would be completely irresponsible on our part to continue to allow the addition of more burden to an already faltering system. This would simply mean propagating the existing situation. It must be clearly understood by all who read this report that the moratorium is not to shackle the city in any way. This moratorium, in conjunction with other recommendations in this report, will create a safer, healthier environment for our current citizens and businesses and assure new businesses and new citizens that they have a solid infrastructure on which to base their venture into our City.

With these thoughts in mind, this permanent qualified moratorium is unanimously presented in the strongest possible way.

This moratorium is not recommended to be a "one time" happening and then be forgotten. If all areas are deemed acceptable by the moratorium, then construction can be conducted without restraint. However, one "occurrence" (see definition in section 3.1.1) will cause the restrictions of this moratorium to be invoked. This moratorium is not intended to curtail all future building in the city, but to promote and assure responsible construction with the emphasis on protecting the health and welfare of the current

citizens, as well as assuring the new builders that their investment is serviced by a solid sewer infrastructure. Building in any area would then be safe, because the City is on guard.

3.1.1 Areas Affected

All areas of Boone. It is suggested that the seven lateral trunk service areas defined by the Nilles Associates generated Sanitary Sewer System Plan of Action be used to define those areas that fall under the moratorium. (See Appendix B for figure 1 of that plan. Larger copies are available on www.boonegov.com) Even **one instance** of an occurrence will be cause to institute or continue the ban on any new construction affecting the sewer systems within that area. **Occurrence, in this instance, is defined as water or sewage in a basement or standing storm water for more than 24 hours.**

Also included in this ban will be any areas "above" the problem area. For instance if an area on south Story Street (service area G) is affected, areas "above" (service areas A,B,C,D,F) will be added to, or continue to be part of the moratorium and will not be allowed to add to the amount of sewage or storm water flowing through or into that affected area (service area G).

3.1.2 In Process Construction

Construction that is partially completed in problem areas at the time this moratorium is established, will be allowed to continue, but will not be allowed to connect to the City sewer system until the City verifies that all sewer handling facilities have been built according to the original specification or to approved deviations (see below). Water retention ponds are to be designed and built to contain, on the construction site, a 100 year rain event (per City Engineers). This must be validated by on site measurements by City personnel.

No sewer connections can be put into full service until all of the new construction sewer pipes and connections have been inspected via City camera or cameras contracted by the City to assure that all pipes have been correctly installed and that there are no blockages or debris in the pipes.

All grades and elevations must be validated by City personnel to assure there has been no deviation from the original specifications. It shall be the responsibility of the Building Official to assure that this is completed prior to approval.

Any deviation from the original specification must be documented and approved by the City Engineer and the Boone Building Official prior to implementing the deviation. All deviations must be inspected on site before construction progresses to the point that inspection becomes impossible.

It is the responsibility of the City to assure that the "down stream" evaluations and necessary modifications are made to the sewer systems prior to allowing the contractor to connect to the sanitary or storm sewer systems. This assures that no new construction will place additional burden on a known problem area or create a problem area where none previously existed.

3.1.3 Proposed New Construction

New construction will not be allowed in areas affected by sewer system issues if it has any negative affect on the sewer systems. For instance, new housing and businesses would be banned, but a new garage on an existing lot may be allowed.

When the City has repaired or modified the sewer systems to assure that they will handle the existing flows as well as the proposed additional flows that will be allowed by the City zoning currently in affect, the area will be opened for new construction. Again, the sewer system affected by this directive not only covers the actual construction site, but neighboring sites, as well as the areas "down stream" to assure that activity in one area does not adversely affect the residents in another area.

No new construction will be allowed in any residential area of the city until the zoning ordinances are reviewed to assure that multi resident housing is not built in an area that has an infrastructure that will only accommodate the density of single family homes. The multi-unit construction in the northeast corner of Boone is an example of the city turning a blind eye to existing problems. This construction will only intensify the water problems in that area. It is, therefore, recommended in the strongest possible way, that all construction feeding into the NE section of the city be banned until such time as all phases of the current sewer expansion plan are completed and a comprehensive maintenance program is implemented and has made one pass over the entire City. See section 3.3 of this report.

All new construction plans must assure that all water coming into the area has been considered. This includes surface water as well as water coming in via underground conduits such as pipes, tile, etc.

All new construction must be designed to accommodate, at a minimum, a ten year rain event.

No new construction will be permitted that has not considered the "down stream" impact on the sewer systems and the residents connected to them. No negative impact will be allowed. Negative impact, in this instance, is defined as anything having to do with either the sanitary or storm sewer systems that will increase the probability of damage to property or health of current residents or businesses.

"As built" drawings will be required on all new construction affecting either the sanitary or storm sewer systems. These drawings **must be validated** by the City, particularly when deviations from the original documentation have any affect on the sanitary or storm sewer systems.

3.1.4 In Process Inspection

It is the belief of the AAC that on site inspection or evaluation of building or construction sites needs to be performed by City personnel to ensure that all critical phases of all projects, including sanitary and storm sewers, are completed as approved. Anything less will put the City at the mercy of the construction industry with no checks and balances. Deviations from the original, approved design documents may or may not be documented by the builder and subsequently approved and validated by City personnel. In process inspections are critical and mandatory.

Critical junctures in the building process, particularly those points where later inspection would be impossible, must also be inspected, validated and evaluated by City personnel. These "critical junctures" will be defined by the Building Official. Personal inspection is required. The submission of a signed drawing will no longer be the final accepted document, no matter who it is signed by.

To this end, the office of The Boone Building Official must be seriously scrutinized to assure that the resources are available to accomplish these tasks in a timely manner. Possible solutions may be the addition of personnel or contracting with external sources to assure that the best interests of the City and its citizens are protected. Cross training of personnel from other branches of City employees is also a viable option.

3.1.5 Maintenance Capabilities

A constant reminder throughout the life of this AAC has been that there is a hiring freeze and that there are simply not enough human resources to do the job that is required. This brings to mind the anecdote of the farmer that, in order to cut feed expenses, continually decreased the amount of feed that he gave his horse until it finally died. It is strongly suggested that sharing resources, adding resources, transferring resources from one department to another, etc. must be investigated to relieve the current residents of the ugly burden of property damage and health issues resulting from an overloaded and inadequate storm and sanitary sewer system. This will also promote cross training among the City employees. This type of activity often uncovers new talent that had not previously been utilized.

No new addition to the sewer system infrastructure will be allowed without sufficient maintenance capability to maintain it. We are having the present problems because

maintenance and upgrade was not performed on a regular basis in the past. It is unconscionable that we would continue to follow this path to destruction.

It must become a permanent resolution of the City Council to provide funds for the perpetuation of proactive sanitary and storm system maintenance programs. Raiding of these funds for other purposes must no longer be allowed. The safety and health of the citizens must become, and remain, the utmost priority of the City Council.

3.2 Prioritization Of Storm Water Studies

The logic and criteria used to prioritize the three water studies in question was relatively simple and straight forward. Consideration was given to the number of people/homes/businesses affected by each of the studies and their associated proposed solutions. Unconsciously, we probably gave some added weight to seizing the opportunity to directly alleviate the pressure on as many people possible. We also considered the number of people affected "down stream" of the problem area. However, in scrutinizing the studies, it became apparent that there were some very significant Engineering differences. These differences are listed under the associated study.

Careful consideration was also given to the moratorium in section 3.1. The sequencing of these events supports the lifting of the moratorium as quickly as possible.

In all cases, there was concern that although the studies considered the surface water and possibly the surface water from surrounding areas, there was no consideration for the possibility of water coming into the area from underground sources such as old county drains, leakage from bricked in Honey Creek or tile. The making of this observation to the City Engineering Team elicited a shrug of the shoulders, but no response.

Of great concern to the AAC was the fact that the City Engineering representatives did not know or understand these studies well enough to answer our questions, even though they knew in advance what the topic for the meeting would be. For instance, they appeared surprised when they were informed that while one study was predicated on a 5 year rain event, another one used 100 year factors. They agreed that the pond at 22nd and Linn would be able to hold a 100 year event. However, they were at a loss for an answer as to why the input to that pond was limited to a 5 year rate. There was no answer as to why different rainfall parameters and study methodologies were used. These and other displays of ineptitude did little to bolster our faith in their findings in **any** situation.

Our conversations with Nilles Associates, however, resulted in the opposite experience. Their responses were candid, well thought out and obviously had the best interests of the City in mind. The contrast between these two engineering firms was obvious, can not be emphasized too strongly, and must be considered when engineering expertise is required in the future.

3.2.1 Detention Ponds - Critical Observation

Friend, or foe just waiting to pounce? There is major concern being voiced about the detention ponds being created in the city. It is logical that these ponds, during and after a significant rain event, will raise the underground water level, creating extreme pressure on basement walls and floors in the nearby structures. When this happens and the result is structural damage to surrounding buildings, it would appear that the city may be liable for some substantial repair bills or, even worse, be put in a position to have to purchase homes with substantial structural damage.

This damage will not be viewed strictly as an act of nature, but may possibly be seen as the irresponsible actions of the City, regardless of whether the causal action was recommended by an engineering firm. The engineering firm is chartered by the city to perform a specific study to determine how to deal with a specific symptom. Unless clearly **articulated** in the engineering work order and **verified** by City personnel, the engineering company will not, and has not, projected results of their specific recommendation onto the City sanitary and storm sewer systems as a whole.

It became painfully obvious, during our investigation, that the current detention ponds are poorly designed and inadequate. Although work is supposedly in process to correct some of these issues, other issues have not been highlighted and are not even recognized as problems at this time. These issues must be included in the study called for in section 3.2.5 of this report.

It is **strongly recommended** that the city retain the services of a competent hydrologist, **not** from City Engineering, to determine what stresses are being applied to the homes and other structures surrounding the existing detention ponds. Sooner or later, someone is going to raise the issue.

The basement problems in the Lowell Park area and at 17th and Benton, sewage in the basements at 21st and Cedar streets, sewage in the basements in the South Story Street area, sewage backup in basements throughout the central corridor of the City and many more recent instances of water and sewage damage, often where there were none previously, are very strong indicators that something is changing or being changed within the storm and sanitary sewer system. The voice of the citizenry is getting louder with each instance of storm water damage.
It may very well be that the City is just one heavy rain away from bankruptcy.

3.2.2 Northeast Boone Drainage Study

This project was given first priority. Not only were the largest number of residents directly affected in the study area, the “down stream” impact is the greatest. This area feeds the most water into the lower reaches of the drainage system. A solution at this point would have a greater positive impact on other areas of the storm sewer system.

However, before this project begins, there are some items and discrepancies that must be investigated. The water rate used for the projections of this study is for a 5 year rain event. In the Lowell Study, a 100 year rate is used. Also, the methodology and rainfall factors used in this study do not match the other studies. Why? (No response from City Engineers.) Are we being told results from factual data, or are we being told what we want to hear? What facts are in the best interest of the City and its citizens?

The City Engineers told us that the holding pond at 22nd and Linn was large enough to hold a 100 year rain event, but the input and output of the pond was designed for a 5 year rain event. If the pond will hold a 100 year event, why are we letting the water flood over the ground and streets, houses and basements rather than get it into the pond and then let it into the sewer system at a 5 year rate? The action proposed by this study does not appear to make any logical sense. City Engineering had no response when questioned about this aspect of the study.

This area also has a greater potential for expansion. Having said this, it would seem prudent to expand the size of the pipe along 22nd street to accommodate a much larger event (egress into the detention pond at a 100 year rate) in anticipation of future growth and development. It would be much more economical to lay the larger pipe now than to come back and do it at some future date.

The recommended implementation of this study, after validation by a different Engineering firm and assuming that the validating firm agrees, is Phase 1 immediately. This is the restriction of the flow at the west storm pond outlet. However, until the pond is used to detain flood water, this action seems futile.

Then Phase 2, the upsizing of the piping serving reaches 7-0, 3-0 and 3-1. Then add the flow diversions of westerly flows into the pond along with the outflow restriction.

3.2.3 Lowell Park Drainage Study

This project was given second priority. The number of residents directly affected were the second largest and the "down stream" impact to other parts of the city was not as great as the Northeast Boone Drainage Study, but much greater than the Snedden Drive Study.

This study was predicated on handling a 100 year rain event and drains into a pond that will release at a 5 year rate, unlike the Northeast Boone Drainage Study. See Section 3.2.2.

The second alternative is recommended to eliminate the need to purchase additional farm land and build yet another detention pond. Also, there is nothing that would indicate that the detention of storm water above these homes would lessen the danger of structural damage to these homes. See section 3.2.1.

3.2.4 Corporal Roger Snedden Drive Drainage Study

This project was given the lowest priority of the three. Not because the people affected were not as important as those in the other studies, but simply because fewer people were directly affected and there is very little "down stream" impact. However, there is an opportunity for future growth in this area so consideration should be given to providing for more than the minimum requirements.

The second solution is recommended, not only because of cost, but to eliminate the construction of yet another holding pond. See section 3.2.1.

3.2.5 Future Storm Water Studies

There are many issues in Northwest Boone with water runoff. The City is only one clogged drain away from water running into residential basement windows. In addition, this area also feeds down into the rest of the sanitary and storm sewer system, which affects the entire City.

Perhaps it is time to do a complete study of the storm water coming into Boone from the surrounding farmland to the east and north. Based on past performance, and the issues raised in section 2.5 of the Executive Summary, it is recommended that this activity be performed by Nilles Associates who are very familiar with the City water issues from prior studies.

This comprehensive study, similar to the sanitary sewer system study done by Nilles Associates, would be the basis for future modifications, maintenance and expansion of the storm sewer system. Using similar maps and nomenclature for both studies would simplify communication between departments as well as communication with the public.

3.3A Establish A Structured Sanitary Sewer Maintenance Program

The proposed Perpetual Maintenance Program has two phases. The two phases together address the concept and philosophy that seems to have been followed over the past decades. The attitude of "if you can't see it, don't worry about it", has taken the city into the morass where it currently finds itself. Decades of this "blind eye" attitude to the underground infrastructure has created a situation that has no quick or inexpensive remedy. Getting the infrastructure back to a "workable" condition is addressed by Phase 1. This phase must start now in conjunction with several other programs. The information gained from this phase will provide invaluable data to possibly adjust future activity pertaining to both the sanitary and storm sewer systems. It will also provide information that could have a major affect on the building moratorium presented in 3.1 of this report.

It must be noted that the completion of this phase may very well postpone the need to expand the waste water treatment plant for a considerable period of time due to the decreased clear water flow during flooding conditions. The decrease of I/I (influx and inflow) of storm water into the sanitary sewer could decrease the demands on the wastewater treatment plant considerably. Estimates by some are as high as a 50% decrease.

Many things that are implemented in Phase 1 will, obviously, be used in Phase 2 and propagated into other areas of the city governmental structure, as well. Phase 2 is where the maintenance program is fully established and funded as regularly as the Fire Department or the Police Department. The recovery process will be costly and difficult. Once the infrastructure is "rescued" from its current condition, it is absolutely unthinkable that it would be allowed to deteriorate to this condition again.

3.3.1 Phase 1

This will be the most complicated and difficult phase. This is the restoration process that will identify and repair the degeneration of the sewer system that has occurred over the past decades. It is imperative that the activities of this phase be fully documented to provide information that will be required for the continuation of this process into Phase 2. The loss of this information and data will result in major recovery expenditures, again, in the future.

In a sentence, Phase 1 will determine what is wrong with the current sewer system, fix the problems and document the condition of the system both before and after the repairs are made. Although this sounds simple, it is quite complex. Several things must happen simultaneously to assure a successful conclusion.

A recommendation is made to **exclude** the contracted City Engineering firm from the on going maintenance program. It may be necessary to contact them for specific repair projects or a specific modification processes, but the City personnel should be fully capable, or must become fully capable, of handling the repairs, overseeing the repair vendors and documenting the repairs on the GIS.

Although Phase 1 is a specific part of the recovery process, this methodology is highly recommended on a continuing basis. This process will continually evaluate the condition of the sewer system and maintain a current data base to support the future evolution of both the sanitary and storm sewer systems.

3.3.1.1 Current Situation

First, the current situation must be determined. This activity should be performed in the Spring to allow for most realistic evaluation of the system. This time of year will make

the I/I sources much more readily identifiable. This work will be performed by an outside vendor to allow our current facilities and resources to focus on the day-to-day operation of the City as well as begin the repair process immediately. See section 3.3.1.2.

Obviously this activity must be fully documented to assure that future activity is performed based on solid information. The recommendation to provide this documentation system is to implement GIS prior to, or at the very beginning of this process to determine the current condition of the system. The information contained in the GIS data base must have a backup copy stored in a location away from the main computer on a daily basis in the event of a disaster. This information will be invaluable to the city for many future activities. More will be said about this in later parts of this report.

The initial camera work will be done by an outside vendor in conjunction with the removal of roots and other debris from the sewer pipes. The City has a single camera that has limited capability compared to the new and improved models used by vendors. The vendors will also clean the sewers as they go through them to determine the condition of the existing system. This camera data and the findings of the vendor work crew will be documented by the vendor on files that are fully compatible with the GIS that is concurrently being implemented by the City. These files become property of the City.

This activity should be done as quickly as possible. Not only will information be gathered concerning the areas of the structure that need repair, but the removal of roots and debris will immediately improve the overall performance of the system.

It is recommended that approximately one quarter of the city be completed every year. This creates a situation where no part of the sewer system goes any longer than 4 years before it is thoroughly inspected.

3.3.1.2 Fix The Problems

Once the problems are identified, the repair process begins. It remains to be seen if the current Boone personnel and equipment are capable of providing the repair activity required as the deficiencies of the sewer system are identified. It is very doubtful that this activity can be added to the current work load.

Therefore, it is recommended that alternative approaches be identified and put on "standby" if needed. One alternative is to contract some or all of the initial repair work to an outside vendor. This would allow the City resources to handle the daily routines of the City.

The second alternative is to consider using a company to insert sleeves in the lines in selected places to minimize digging up the pipes for repair. This is not only a cheaper method but, in many instances, it is much quicker and has less impact on the residents.

In any event, the repairs must be completed within a year because the following year, another quarter of the city will have the problems identified and be ready for repair.

Using this approach, the repair crews will always be using recent data, not outdated data as they have in the past, or no data at all as is generally the case when repairs are completed due to fighting emergencies identified by the residents.

It is expected that additional repair support will be required for four years to bring the sewer systems back to a "reasonable' condition. After that, it is expected that the City personnel should be able to maintain the ongoing repair requirements as a vendor continues to "clean and camera" at the rate of a quarter of the city per year.

This process, in four years, will get the infrastructure back to a manageable situation. It must also be noted here that there is a school of thought, entertained by many, that this activity alone will provide much needed relief to the entire sewer system.

3.3.1.3 Document Repairs

It must also be strongly emphasized that all repair data be input to the GIS data base for future reference. Currently, the city is using old data, bad data or no data at all. This leads to a lengthy repair process, the expenditure of resources that would better be utilized on other projects and the associated high cost of repair.

3.3.1.4 Where to Start

It is also a strong recommendation of this AAC that this Phase 1 effort is to start in the Northeast quadrant of the city, then the Northwest, followed by the Southeast and finish up with the Southwest quadrant. This prioritization was made using the same criteria used for the storm studies in section 3.2 of this report. The area that had direct impact on the most people as well as the largest opportunity for favorable repercussions "downstream" was given the highest priority. Consideration was also given to the number of complaint calls received by general area. However, the opportunity for wide fluctuations in this data diminished its value in the decision making process.

All of the storm and sanitary sewer pipes must be inspected and evaluated in this phase. Past practices of not using the camera on all new construction makes it imperative that a complete scan is done to fully evaluate and document the current condition of the system.

Proceed very cautiously with the removal of crossovers. This seems to be a very controversial issue. Progress must be made cautiously. It seems that the crossovers were put in place for a reason. A crossover can only be removed if the original purpose for it being there has been clearly identified and it is determined that this function is either no longer required, or is now being provided by some other means.

The key, operative word in this section of the report is "**START**"! Action must be started "**NOW**"! This activity is probably 3-5 decades late already. Costs will escalate exponentially and the sewers will deteriorate at a similar exponential rate. The choice appears to not be one of "now or later", but of "now or never". If the City can't fund this activity now, it certainly will not be able to fund it later as the problem gets worse and the costs get higher.

3.3.2 Phase 2

Phase 2 is actually the beginning of a regular maintenance program for the storm and sanitary sewer systems. Phase 2 begins at the end of Phase 1 and will, essentially, never end if there is any hope of not returning to the problems that the City is currently experiencing.

At this point, at the completion of Phase 1, sufficient data will have been gathered so that an informed decision can be made on how to proceed. Phase 1 will have cleaned the pipes and identified the problems, and the repair procedures will have corrected them.

Issues to be addressed at that time will include:

- Can the city do continuing repair themselves?
- Have better and more efficient repair processes been developed?
- What has been the impact of this process on the overall system?
- What is the decrease of clear water going through the water treatment plant?

These issues should start to be addressed when Phase 1 is about half completed. Any questions surrounding these issues should be addressed at this time. This will provide ample opportunity to revise the data gathering system so that sufficient information is available to make an informed decision in time to reflect any financial information into the CIP process.

Phase 2 will be established as an ongoing process with the completion of the second iteration of the "review, fix and document" process described in Phase 1.

3.3.3 Continuing

The continuation effort on this maintenance program will be a combination of Phase 1 and Phase 2. There are some critical criteria that must be included in the continuing program.

- This program must be funded like any critical service of the City.
- Sufficient human resources and equipment must be dedicated to this effort.
- This must be a City managed program.
- Engineering resources are to be used sparingly and only on an "as needed" basis.
- The entire system will be evaluated and repaired every four years, maximum.

- External resources will be brought in to maintain the time table if required.
- New construction will not be allowed to expand faster than maintenance capabilities.
- Lacking City maintenance capabilities, there must be a clear willingness to budget for work to be completed by vendors.
- Accurate data collection is imperative.
- Let the residents know what is going on.

3.3B Establish A Structured Storm Sewer Maintenance Program

It is strongly recommended that a comprehensive study be made of the storm water sewer system similar in scope to the study done in the sanitary sewer system. These should both be living documents, created and maintained by Nilles Associates. Their consulting service appears to be invaluable. This study should reference the same section boundaries as the sanitary sewer system to help ease the communications between the citizens, the City Council, City Departments, vendors, etc.

This study, like the sanitary study, will provide the basis for developing a structured maintenance program for the storm sewer system. This program should be very similar to the sanitary sewer system described in section 3.3A of this report. Both programs are critical to the health and well being of the citizenry. In addition, both of these programs will relieve pressure on the waste water treatment plant.

The AAC met with Nilles Associates concerning their report on the sanitary sewer issues. We subsequently met with them a second time to discuss the storm water sewer issues. It was our impression that they were straight forward, candid and answered all of our questions clearly and distinctly. No other firm appears to have the in depth knowledge of the sewer issues being faced by Boone.

It is the AAC conclusion that Nilles has demonstrated their abilities and should be considered as the principal firm to carry out this and future projects in this arena.

3.4 Stop Wasting Money On Studies

Many studies have been done in the past. There were fourteen that we know of since 1976. Many of them documented the same problems, which indicates that nothing, or very little was done with the information generated. Many of them have been set aside until they are no longer valid. These "dust catchers" represent thousands of dollars in engineering fees that were spent to create documents that were ignored or unused until they became useless. By the time any action is taken on the areas covered by these studies, the data is old and the physical situations have likely changed. It is certain that the studies will need to be updated or re-evaluated, another engineering expense, before they can be used to make decisions involving the expenditure of funds.

These studies MUST be closely scrutinized for accuracy and consistency. Are the same guidelines used for all studies? If not, are the reasons for the variations clearly articulated and explained? Are cost assumptions valid and current?

Closely review studies for upsizing before bids are let and construction is started. For instance, if a study recommends action that will handle a 10 year rainfall event, review to see what the cost would be to upgrade to a 25, 50 or 100 year rainfall event. The cost of upgrade during construction is considerably less than doing everything over in a few years. Has expected growth and expansion of the City been factored into the process?

Review to assure that all extraneous factors have been considered. For instance, in a storm sewer project, has the water runoff from adjoining property been considered? Has the possibility of underground tile and pipes leading into the area been considered?

Have adverse affects on neighboring property been considered? For instance if the water level caused by a holding pond is above the basement floor level of adjoining homes, what is the hydraulic pressure exerted on the basement walls of these homes and what is the upward hydraulic pressure being exerted on the floors of these basements? What is the City liability in these cases? Is the City prepared to purchase those homes should they sustain major structural damage? Is the City Council aware of the risks being taken?

Increased construction costs and projections in city growth should also be considered as these studies age. At what point does the study become invalid and need to be destroyed?

In discussing the three latest drainage studies (see section 3.2) with Foth Engineering personnel, the AAC found these deficiencies and more. Even though these studies were generated by this Engineering firm, many of our questions were left unanswered, and many were answered by simply saying that "the documents were signed by a Certified Engineer". **Not good enough, not nearly good enough!!**

No one seems to read these reports with the intention of understanding what they say and what they imply. It is by unanimous agreement that the AAC recommends that all data and information be carefully scrutinized for consistency, accuracy and just plain common

sense before any action is taken! It does not appear that there is a requirement to use any specific firm for future special studies. In addition, do not commission studies until funds are identified and action is ready to be taken. **No action without a plan and no plan without specific intent to follow it through.**

3.5 Program To Minimize Storm Water From The Sanitary Sewer

In conjunction with establishing a Sewer Maintenance Program, a program to further minimize storm sewer water from the sanitary sewer system must be started. In fact, some of the people we interviewed and talked to have felt that this is a major cause of our flooding problems. Others disagree. If this is a cause of flooding issues or not is rather academic at this point. The DNR will not continue to allow raw sewage to intermingle in the storm and sanitary sewer systems. This not only contributes to the flooding issue to some degree, but, more importantly, creates a totally unacceptable health issue for the residents of the City.

Stopping the storm water from entering the sanitary sewer system, assuming that crossovers are a major contributor, will be accomplished by the establishment of a permanent maintenance program. This issue is dealt with in section 3.3 of this report. This same program will eliminate a major portion of storm water infiltration and influx into the sanitary sewer system. However, more is to be done.

The AAC has heard of a program where federal funding is available to install sump pumps in homes where there currently are none. This needs to be investigated and, if feasible, the program needs to be established in the City.

At the same time, a program to stop storm water from infiltrating the sanitary sewer from other sources is also needed. Illegal sump pumps, water from rain troughs, water collected in drainage tile around the basements of homes, etc., etc. are all sources that need to be addressed. This will require a concerted effort, complete with a citizen awareness program so everyone will understand the need and support the program.

Only a structured plan of attack with the support of the residents will succeed. Again, knowledge and understanding by all is axiomatic.

3.6 GIS (Geographic Information System)

It is imperative that complete and extremely accurate records be kept of the current status of the sanitary and storm sewer systems to assure accurate data for future repairs or modifications. Without this data, the ongoing maintenance program becomes like Alice in Wonderland. "If you don't know where you are going, any old road will get you there." Lack of data retention would be the beginning of another slide back to where we

currently are. Then another generation would have the opportunity to face the same problems we are dealing with now. It would border on idiocy to allow this to happen.

From this we must conclude that a comprehensive, accurate and complete data base must be established to retain the information generated by any activity in this area for future reference.

The GIS appears to serve this purpose. Not only will it gather and retain information from vendor activity in Phase 1 of the Maintenance Programs, it will also retain any information generated from the sewer system repair process. This is an on-going data base that will retain and provide for the analysis of information on a continual basis. Any activity associated with the sewer systems can be captured, retrieved and analyzed at a future date.

In addition, **there are many other areas where the city can utilize the capabilities of this system**. For instance:

- Information on the water distribution system.
- Information on roads and streets similar to the information on the sewer system.
- Information from the Police Department on accident and crime locations, etc.
- Data on why traffic lights should or should not be installed.
- Information from the Fire Department.
- Information from the Electrical utility company.
- Information from the telephone company.
- Information on street storm water intakes and location.
- Coordinate the activities of the various City departments, Utilities, Streets, etc.
- Specific studies are minimized. Eliminates outdated studies.
- Accurate location of complaints of any kind called into the City.

This data will allow the City to make fully informed decisions without costly studies from external sources, or with minimal input from external sources.

Provision must be made for daily backup of data at a location remote from the main data base. This means in a different building, not just a different room. This data is invaluable and is not replaceable. The longer GIS is in operation, the more valuable the data becomes. This Data can never be reconstructed if lost via system malfunction, natural disaster or any other method.

The cost of this system, with its associated peripheral equipment would have been covered by the engineering cost of a few of the studies that are currently gathering dust on some shelf. By the time these studies could be acted upon, the data may be outdated and the study may need to be updated or completely re-done.

The GIS is NOT the panacea to all of our record keeping problems. Any data base is only as good as the quality and timeliness of the input. Serious consideration must be

given to the provision of adequate portable devices to be used for data input and the training to use them properly. Input activity must be monitored until it becomes a habit of all City personnel.

With accurate timely data, the GIS is an invaluable tool and will recoup its cost many times over.

Without accurate, timely data, the GIS is like a parachute that opens on impact!!

3.7 Develop A New Legal Strategy

The current legal strategy of the City seems to be "cut and run at the first sign of a challenge, if at all possible". This attitude has been evidenced in the past few months by the following actions.

Concerning the building permit to expand Cedar Manor on North Cedar Street, the City attorney made the following statement. "We cannot deny the permit simply because we promised the residents we would not allow additional building in the area due to flooding since we already technically approved it." When did the word of the City Council to the citizens of Boone come to mean so little? No one has ever been able to articulate how the proposed expansion had previously been "technically approved". This area has been a known problem area for years. Documented contact with the Building Official dates as far back as March 12, 2008. However, on July 17, 2008, the building permit was issued and the residents were again abandoned in favor of some "higher calling" known only to the City Council.

The definition of "technically approved", the term used to legally justify the Cedar Manor expansion, must be clearly delineated so all city government personnel conducting future activity in this area will know exactly where the line is before it is crossed.

Recently, a contractor was allowed to retract their low bid for sewer modifications without penalty, allowing some $280,000 + of bonding money to go unclaimed by the City. It seems that the City listened to the Bonding Company Lawyers and agreed to not go after the bond money. One of the AAC members had a discussion with a well known Iowa Building Contractor, and the Contractor's opinion was that because of the lack of due diligence by the City in validating the claims of the bonding company attorneys, the contractor "really got by with one that time". The Contractor felt very strongly that the bond should have been forfeited as a minimum and further legal action against the bidding firm was a definite possibility. At a bare minimum, the City could have claimed part of the money to pay for the City's time and expenses.

This “don’t cause any waves” approach about legal issues and disregard for the citizenry is not only costing the City and it’s residents money, but is giving the City a reputation that certainly does not enhance the City’s bargaining position in any future transactions.

3.8 Financing

There are many reasons that the AAC did not delve deeply into the area of how to finance the issues covered in this report. Probably foremost of these reasons is that we felt it would stifle the creativity of the AAC and sidetrack us from the original purpose.

Several areas have been recommended for further studies (see Section 4) that appear to be lucrative sources for decreasing the City operating expenses without having any adverse affect on the overall capability of the City to provide necessary services.

Identifying and obtaining monies available from external sources requires knowledge far beyond the experience represented on this AAC. The AAC feels that the arena of finance is a specialty field that requires specific expertise. However, it is felt that the magnitude of the efforts recommended in this report will require the support of the residents of the City if they are to be implemented in a time frame consistent with the aversion of an even greater disastrous situation.

An increase in Sanitary and Storm Sewer fees is an obvious source of revenue, but needs to be carefully and clearly presented to the public. A carefully thought out plan to inform the residents must be devised. The facts surrounding the issues must be clearly articulated via several media methodologies to assure that the widest possible audience is reached and understand the critical need and positive impact of the City actions.

It is felt that the residents, if fully informed of the issues, the solutions to be implemented, the positive impact and the far reaching benefits for the City of Boone, will respond in a favorable manner. The City has “coasted” in these problem areas for decades and it is now time to “stand up and be counted”. The use of the Capital Fund for sanitary sewers and the use of the Storm Water for storm sewers would be an obvious place to get additional funds quickly to start these programs. These line items on the Utility Bills could be adjusted quickly, up or down, as the needs were identified and/or satisfied. A communication program with the citizens would be required for this action.

One obvious, glaring fact that threads itself throughout the efforts of this AAC is that the City has not set aside finances to deal with any kind of major disaster. This situation must be remedied, hopefully before the next disaster strikes. This City, County and State were, and still are, inhabited primarily by people who believe in being self sufficient. An axiom of this stance is that a financial position was maintained to “save during the good years so they could survive during the bad ones”. This same philosophy must be embraced by the City if it is to be financially prepared for the future.

The question of City insurance also came up. Does the City have adequate disaster insurance? This avenue was not explored by this AAC.

Due to financing not being the forte of this AAC, we are not able to point to the exact source of funds required to move the City forward in this area. However, every effort has been made to articulate the clear and present need for this activity. Resources must be allocated to revitalize the infrastructure of the City if the City is to remain a viable home to its residents. Every avenue must be pursued to obtain the necessary financing. Also, perhaps it is time for other parts of the City budget to return the favor and re-allocate part of their finances and resources to the effort of resuscitating the City infrastructure.

4. Opportunities For Future AACs

During the course of the AAC operations, several issues were discovered that will require the attention of future AACs. In some cases, the knowledge and experience was not present on this AAC and in other cases, there simply was not enough time to delve into these issues.

The shopping list of potential and real issues within the City seems endless. Included are:

- No one seems to be talking to each other or major departments are left out of the decision making process.
- Engineering studies are left unread, or worse they are glanced at and considered read. A little knowledge can, indeed, be a dangerous thing.
- Communication between departments should be instinctive, not mandated.
- It would appear that it is too much to expect one person to coordinate all departments and all committees on all projects and issues.
- Whenever two or more people get together, there is a potential for a communication problem. This must be recognized and dealt with by everyone.

These are a few of the things uncovered by the AAC. Unfortunately, we could not deal with all of the issues we uncovered. In any case, it is felt that the City would benefit from further study of the following issues.

4.1 Finance Committee

This should be a standing committee that might change members on a pre-determined basis, similar to members of the City Council. This is an area that requires knowledge that is not present on this AAC. This committee should include Boone citizens from the Banking, Investment and Financial disciplines.

A prime objective of this committee would be to evaluate and recommend opportunities to get the City on a "pay as you go" basis. An article on page 12A of the September 21, 2008 Central Edition of the Des Moines Sunday Register gave the results of a poll stating that "Iowans prefer up front flood preparedness". 63% said "sacrifice now" and 27% said "do the basics". Only 10% were "not sure". With the recent floods in mind, the opportunity to garner support from the citizenry may be now.

The question of adequate disaster insurance may well fall within the responsibilities of this committee.

Oversight responsibility for all parts of the city budget would also fall within the scope of this committee.

This committee should also be chartered to determine how to improve the rating of Boone bonds.

4.2 Innovative Sewer Repair

The technology in this area is advancing dramatically. Issues with 100 year old sewer lines is certainly not limited to Boone. This team should be chartered to contact other communities similar to Boone to discuss their approach to these problems and also contact various vendors to determine costs and viability of different repair processes that would not require digging trenches and tearing up streets. These processes may also be used to plug crossover lines. This activity must not delay the beginning of Phase 1 of the Sewer Maintenance Program.

4.3 Review Of Existing Building Codes And Zoning

Many of the current issues seem to center around the fact that multiple family dwellings are encroaching on areas that have only had single family homes in the past. This seems to be happening with no associated expansion of the sanitary or storm sewer capabilities. Also, areas are being developed, seemingly without thought being given to surrounding areas such as farm land and previous water problems.

Building and zoning codes must be updated to catch up with the current issues facing the city and be continually reviewed on a regular basis to assure that the requirements of the City are being properly regulated.

4.4 Review Of Application Of City Building Codes

It is strongly recommended that the current practices of applying City Building Codes be reviewed and/or revised to assure that a more holistic approach be taken when granting building permits.

For instance, a review of the sewer system capabilities from the proposed building site all of the way to the city sewer waste water treatment plant must be done to assure that no part of the system will be overloaded by the new construction. A similar review must be made of the storm sewer from the construction site to it's outlet from the city. Also, special consideration must be given to areas with a prior history of sanitary and/or storm sewer problems.

4.5 Develop A CIP Process

The current CIP process is disorganized, to say the very least. A process needs to be developed that requires input to be structured on a single form so all inputs are similar, simplifying the review and prioritization process. Return on Investment (ROI), alternatives considered, possible sources, expected life, City impact (short & long range) and yearly updates are but some of the many areas that must be included. This process

should be reviewed concurrent with the possibility of a centralized purchasing department as discussed in the following section.

Do not minimize the importance of what may seem to be an academic process. This CIP process will play a very large role in how the City spends a major portion of its money.

4.6 Centralized Purchasing Department

The centralization of the purchasing function has long been a standard of industry and is obviously successful based on the longevity of the practice. Professional purchasing employees are able to ferret out previously unused sources of many of the items currently purchased by the individual departments. Purchasing Agents are exceptional negotiators and are skilled at the competitive bidding process. Nearly all of the expenditures of the City should pass through this department. They will purchase items from pencils to bulldozers and even handle the negotiation of service contracts, etc.

Serious consideration should be given to this concept. Centralizing this activity will not only provide its own rewards, it will free up time for the department heads.

4.7 Problem Area Studies

The commission and use of these studies is probably the most extravagant and useless of all of the things that this AAC has encountered. Many studies were reviewed that were old and outdated that had never been acted upon. They were simply put on a shelf until they were either outdated or replaced by other studies.

No one, including Foth Engineering, could tell us what prompted them to do a specific study. No document or work order was created. The engineering firm simply did the study and sent the bill, whatever it was, to the City to be paid.

The parameters of the study were apparently determined by Foth Engineering. No documentation was found that delineated the extent of the study, what area it should cover, what the expected outcome was, when it should be done, etc., etc.

This practice must stop immediately! It is the understanding of this AAC that work orders must now be generated, but discussions of the parameters of each study may still not be completely defined or documented. Another reason to implement a strong Purchasing Department. See section 4.6.

After the study is defined and documented, estimates and history will allow the City to determine if funds are available for the project in a timely fashion. If the funds are not available, perhaps the study should be postponed. This will assure that fresh data will provide the basis for any ensuing action.

4.8 Public Safety Program

This Team would explore the concept of having a Public Safety Officer replace what we currently know as a Policeman, a Fireman and a Public Works Infraction Officer. One person, trained in all disciplines and equipped with a vehicle that could respond to any problem within these areas would perform the tasks of many. These people, constantly on patrol throughout the city, could respond more quickly to any situation and resolve many issues without calling for any assistance or for minimal assistance. While on patrol, they could also recognize and give citations for infractions of all city ordinances.

This team, in conjunction with one or both of the following task teams could develop a scenario that would save the City millions of dollars a year without a significant degradation of public safety. This money could be used to pay for City improvements and/or property tax relief. This is perceived as "cutting edge" thinking and the City would be demonstrating community leadership with this type of program.

4.8.1 Contract Police Force

This team would examine the pros and cons of contracting all or part of the duties of the current police force with similar county or state organizations.

This activity has a potential for tremendous savings in salaries, benefits, equipment, etc.

4.8.2 Volunteer Fire Department

This team would investigate the potential savings to the City of replacing the current Fire Department with an all volunteer department, or a combination of the two. This would be done without significantly degrading the current level of service.

Exploration of a closer alliance with the hospital ambulance service to eliminate the need of the Fire Department responding to every 911 call should also be included in this team charter. Contact should be made with other cities similar to Boone to determine how they are structured and to explore other innovative methods.

This activity has a potential for tremendous savings in salaries, benefits, equipment, etc.

4.9 The Future Of Boone

This team would be chartered to examine past, current and projected growth patterns of the City and surrounding area to determine what is the most probable scenario for the future of the City. Currently, people are of different opinions concerning this issue. The thought spectrum varies from a bedroom community to an industrial "megopolous".

Conjecture on the part of this AAC is that reality is probably somewhere in between the extremes, but much closer to a bedroom, retirement community. Considering our nearly zero growth rate over the past decades, this would appear to be a reasonable assumption.

This team would also need to consider infrastructure, zoning, funding, streets, water, power, etc.

This information, updated on a regular, periodic basis would assist in the daily decision making process of many City departments.

Results from this team would not, necessarily, forecast what the City will be at specific points in the future, but would provide "most likely" scenarios on growth patterns, development trends, expansion direction, etc.

4.10 Committee Of CATS

If the concept of **Citizen Action Teams** (CATS ---pretty catchy, huh?) catches on and grows, it is quite likely that the activity will begin to consume inordinate amounts of the City Administrator's time.

This committee may be composed of a combination of citizens, City employees and leaders from City Government. They would provide direction and coordinate the activities of the various CATS. It would be the responsibility of this committee to assure that effort was not being duplicated and that information developed in one CAT would be disseminated to other CATS as required.

The Chairperson of this committee, preferably selected from the citizens involved, would report directly to the City Administrator with possible periodic appearances at the City Council.

4.11 Publicity

The importance of publicity during this endeavor and beyond can not be over stated. The more the public knows about what the City Government is doing and planning, the better off the City will be. Even negative comments indicate involvement, and this is a good thing. Eventually, all monies come from the citizens, directly or indirectly.

This team will be chartered to devise a multi-media program to inform the citizenry and promote community involvement and support.

5. Thoughts, Feelings And Concerns Of The AAC

5.1 Major Concern

The major concern of this AAC is that they have been sent on a fools errand and that this report will join the many other reports that are currently sitting on shelves gathering dust, totally unused, just waiting for someone to throw them away and put them out of their misery.

5.2 Thoughts And Feelings

Assuming that the reader has gotten this far and is still interested, the experience of being on this AAC and working with fellow citizens of Boone has been rewarding and enjoyable. The diversity of the AAC members has been a plus. It has fostered new perspectives and new ways of thinking that probably would not have happened had everyone been from a similar background.

Although there was some consternation at the beginning when we tried to form the charter too soon, it became easier to focus our attention on specific issues as we went along. In the future, we would suggest that the AAC charter be more clearly defined before the AAC is structured. This will provide the AAC with clear focus more quickly and allow them to progress more rapidly. These teams would probably be kept small, with the members selected from diverse backgrounds

It was both a help and a hindrance that each of the members had a personal interest in the specific issues. In some cases it helped focus and in others it fragmented our thinking for short periods of time. However, the AAC, as a whole, managed to discipline themselves and each other and keep on track. In some cases, it was difficult to elevate the AAC above personal concerns and remain objective. At first, we were eight strangers in a room and the first order of business was to select people to play key rolls in the overall effort. This was difficult at first, but after a couple of meetings, everyone gravitated toward their area of expertise and naturally assumed the various assignments that needed filling.

The major accomplishment of the AAC, besides producing this report, was that each of the members had the opportunity to better understand the problems that the current City Government is facing. We also realized that there are no easy or quick fixes to the issues at hand.

The experience was definitely a good one for all of us and it is highly recommended that more AACs be structured and commissioned in the future. This is an excellent way for citizens to become involved and to feel "ownership" for their City Government. The greater the involvement by a broad spectrum of the citizens, the greater the benefit to the City.

The other side of that coin is that this is also an excellent way for the City to get some very good advice and support from the citizenry. The general population of Boone is highly diverse and can be utilized to supply a guiding force and a steadying hand in many situations.

Don't sell the old folks short. Many retired people have already made many mistakes in the areas of concern that are facing the City. It seems prudent to learn from this experience and not go out and make the same mistakes over again.

Technology in every field is expanding daily. If AACs such as this one and the others proposed above can investigate and separate that technology into categories that the City can use, it would appear that this would be a gift of time and talent to the City.

We are not sure how you could ever measure the value of these AACs to the City in terms of dollars and cents. However, after having served on this AAC, we all feel that the potential is there to be used by a wise City Council.

Appendix A

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Information Sources

In many instances, data was tracked down on the internet or cajoled from any other available source. The City Administrator seemed to be an unending source of data that often dispelled the myth of rumor and put us back on the right track.

In addition to all of the data received from the sources above, the people listed below agreed to appear before this AAC and share their knowledge with us. Mostly, except where noted, the experience was enjoyable and enlightening.

Department of Natural Resources Jim Striker Field office Supervisor

- Oversees South central Iowa.
- Seemed hesitant about agreeing that our three phase approach was the best one.
- Boone is high on list of worst sewer systems.
    - Typical sewer uses 80 - 100 gallons per person.
    - Bad system will multiply during rain to 500 gallons per person.
    - Few systems in state as bad as 1000 gallons per person.
    - Boone approaches 2000 gallons per person.
    - Boone water in the sanitary plant equal to Ames during the last major flood event though only a quarter to a fifth of the size.
    - Boone treating significant amount of clear water.
- If the current system additions and repairs fail to address the issues, the city will be required to complete additional work.
- Failure to comply with the current plan could result in $10,000 per day fine.
- Authorization is obtained under Section 455 of the Iowa Code and Iowa Administrative Code. Further authority granted under Federal Law.
- Need to address collector lines or will need to add to waste water plant.
- Talked of approaches of other cities.
    - Indianola - quartered town, camera and repair connectors and bottlenecks. Noted plan to address crossovers, footing drains and bottlenecks.
    - Kellogg - Noted use of liners such as INSTAFORM. Cut clear water flow by 50%.

Hydro Klean Tom Hay Cost Estimator and Sales

- Quarter the city and do one section per year.
- Clean and camera sewers.
- Camera and other equipment superior to Boone's.
- Information from cameras can be interfaced to GIS.
- Frees up City staff and equipment to do repairs and address hot spots.
- $80K to $100K per year to do a quarter of the City.

Boone City Public Works John Rouse Director of Public Works

- Good information.
- Depends very heavily on employees for technical information.
- Sewer employees spend 75% of time putting out fires, only 25% with maintenance.
- Lack of manpower to become maintenance focused.
- Wanted a structured maintenance program.
- Definitely wanted GIS.
- Could benefit from vendor cleaning and doing the camera work.
- Acknowledges that with regard to sewers we are in bad shape.
- Manager, program and special task oriented.
- Short on employees and time.

Foth Engineering Alliance Douglas Ernst, PE Sr. Project Manager
Wayne Schwartz, PE Project Civil Engineer

- A very disappointing meeting.
- We could not arrive at a mutually agreeable date to talk to Nick Kuhn.
- Disturbing lack of solid information.
- Seemingly not familiar with the three studies.
- More than willing to pass the buck.
- Unable to explain inconsistency of the studies.
- Unable to explain explicit facts in the studies.
- Generated considerable consternation on the part of AAC members.
- No specifics for Infiltration/Inflow.

Boone City Administrator Luke Nelson Boone City Administrator

- Good information.
- Very candid responses.
- Covered wide variety of topics.
- Would like to question the AAC at future date.
- $9-10Kto get GIS handheld system and software.
- Intern could be possible source of data entry. Cost minimal.
- Must educate on GIS.
- $1k per person safe amount for training.
- As built drawings could be required of contractors.

Boone Building Official **Ed Higgins Boone Building Official**

- Does building inspection electrical, mechanical, etc.
- Engineer does all topographical work.
- Assures that developer meets codes.
- Codes are bare minimum.
- No review beyond actual build site.
- No "down stream" review of sewers.
- Once it is underground, responsibility transfers to others.
- Investigation does not go beyond lot lines - new construction.
- City uses many codes.
- City can go beyond codes if they choose.
- No recent changes re storm water.
- Not included in sewer discussions.
- Retention pond with over 2' of water needs fence.
- Has a GIS system but needs much work.
- I/I problems must be fixed.

Nilles Associates **John Nilles Owner**
Ross Hillsman Sanitary Sewer Specialist

- Excellent meeting.
- Clear, concise answers to probing questions.
- Not afraid to be candid and willing to say "I don't know" when necessary.
- No relationship between Nilles Associates and Foth.
- Plan of Action is an excellent document.
- They **volunteered** to come talk to us.
- Boone is not different from many other cities, Ankeny, Johnston.
- This is an ongoing problem and will not be solved quickly.
- Spoke of multiple repair technologies.
- Advocates a block by block approach.
- Waste water plant big enough to handle routine sewage.
- Advocates turning maintenance process over to City employees.
- Be careful of the liners we choose to use.
- Today Boone can expand south of Mamie Eisenhower.
- Not a good idea to expand into trouble area.
- Nilles Associates is ready and capable of taking back Boone.
- Greg Pierce is storm water expert.
- Volunteered him to come next week

Nilles Associates	**John Nilles**	**Owner**
	Greg Pierce	**Storm Sewer Specialist**
	Ross Hillsman	**Sanitary Sewer Specialist**

- An excellent meeting.
- The AAC received a lot of information.
- Pointed out the Storm Water line item on the water bill.
- Information on the design of detention ponds.
- Provide information for developers and builders.
- Information on the use of parking lots for detention ponds.
- Many options now available to move storm water out of the city.
- Need comprehensive plan for storm sewers.
- Need land usage plan for the City.
- Their methods of modeling have been proven over time by nature.
- Many studies tend to undersize the requirements.
- Consistency needed in all reports and studies.
- Studies often say what the customer wants to hear.
- Studies can be presented differently.
- People seldom read the reports carefully, rely on presentations.
- Noted -- Engineer can be aggressive or conservative.

Appendix B

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