# CITY COUNCIL WORKSHOP
# JULY 16, 2012
# 6:00 PM

## HOYLE TANNER ENGINEERS REGARDING UTILITY/DRAINAGE ASSESSMENT OF HIGH/MARKET STREETS TE GRANT AREA

Nelson L Thibault, a principal and one of the owners of Hoyle, Tanner Associates, Inc. thanked the Mayor and City Council for having them, as well as City Manager Belmore and his staff for their assistance. He introduced Bill Davidson who heads up the Portsmouth office; he is the office and project manager on this project. His specialty is storm drainage. He said that John Jackman has returned to Hoyle, Tanner after many years of training with the City and they are happy to have him back.

Mr. Thibault outlined some of the many projects they have done in Somersworth. They have a long history of working with Somersworth, saying that Somersworth was one of their first clients.

Bill Davidson said that they researched existing data on Somersworth, including the GIS system. They asked residents about flooding and utility issues. They had field investigations. They interviewed staff and used resident data from the information mailer. They not only did a traditional assessment where you would look at useful life of materials and utilities, etc., they followed up with "consequences of failure" of a certain utility, either cost or loss of service. They looked at how you manage that risk.

They said the drainage system is made up of about 4500 feet of vitrified clay pipe, which used to be the combined sewer and storm water system. In the 1980's, Hoyle, Tanner designed a separate sewer system so they are no longer combined. The pipes have a lot of joints and are brittle and not used for drainage. They built a model using hydro-cad and they could run 2, 10 or 50 year storms to see how the system takes that volume of water. With those 8-10 inch pipe, he said, you can pass a two year storm. If you were designing a new system you would probably want to design for a 25 year storm; 10 year at the very minimum. He said that some catch basins are still connected to the sewer system. They discovered that when they did smoke tests. So in a rain event, that water is being taken down to the treatment plant and being treated.

John Jackman looked at 3,800 feet of unlined cast iron pipe; all except one of which is over 100 years old, with lead joints. Typically you would just say, replace it, but utilizing risk management, you start evaluating the water system, regardless of age. They look for high fire flows where they need them and bi-directional flows. They ask if the line failed could they still provide fire flows. They looked at asset failures, water quality, incidents of bacteria hits, color, taste, issues with water lines, etc. These are all part of the decision making about the whether they should be replaced or not. They also look at corrosivity of the water and the soil. The pipes are looked at throughout the area.

Almost all the services have been replaced with copper lines and have good services as of right now. They looked at valves and the number of breaks; 7 over a 25 year period. That is the risk. What is an acceptable risk? They considered different scenarios and put a matrix every 1000 feet of line which is an average of one break every 4 years per 1000 feet. That gives you a way to measure your risk of failure. Most of the breaks indicate soil movement, etc. Then they look to mitigate/reduce risk, they isolate more areas so if the water line breaks, you would minimize the number of people without service. They also looked at hydrants and valves…

With the sewer they use PACP to evaluate manholes and pipes, this is used throughout the country, that condition assessment can be used year after year. It is a way to see if the lines continue to deteriorate. Sewer is 3,100 feet of PVC line. That will be left in place. He looked at the condition of all. You develop standardization, especially for assets that you are going to leave in place. The vitrified clay pipe on Main and Market Streets are over 100 years old. They cleaned and televised those lines. They found breaks and cracks. It allowed them to understand what is there and to come up with alternative solutions other than just digging it up.

Councilor Witham asked why they left the clay pipe. Nelson Thibault answered that there was a lot of duplicate piping; some streets had two or three lines that were put in over the years. Some was missed, unintentionally.

They came up with alternative solutions to minimize risk and expenses. They can line some clay pipes which are still functioning well. Some service lines are not going to be replaced, i.e., under sidewalks, they are adding manholes to reduce the amount of sewer lines, maintenance, etc. Some pipes are still a mystery and during the design process those will probably be further identified. He outlines some changes to the sewer lines that they would do, saying it is a cost effective way to minimize risk.

What is the health and safety impact to the community of any potential failure of assets? They look at loss of service. There is real cost with lost service to homes and businesses. You have to assign some kind of value to loss of service. Do water, sewer, etc., meet criteria if you were going to design it now? They look at history of failure. There is a cost to the City, too: a cost to repair these. Can it be repaired within the budget or would it have to go to the Finance Committee, Council or CIP? When it fails, you need to understand what the financial impact of the failure is. Mr. Jackman went through the matrix which differentiates the probability of failure and the consequences: low probability & low consequence, low probability & high consequence, high probability & low consequence and high probability & high consequence. The goal is to move all assets to low probability of failure with low consequences of failure. If they focus on the items in the other domains and what would need to be done to move them to lower probability and consequences.

When you look at assets, you look to see if it is operational due to failure or deterioration. That is part of the evaluation process.

Mr. Davidson then discussed the probable cost of the designated improvements, not utilizing risk management versus utilizing risk management.

He mentioned the brick manholes as likely to need repair or replacement. He said that if you replace the 8 inch pipes with 15 inch pipes, you would get probably a little better than the 10 year storm event. 18 inch in certain locations would be more in line with a 25 year storm event. The cost to go from 15 inch pipe to 18 inch pipe would be about $6.00 per linear foot; for 5000 feet, you are talking about $30,000 which is a huge jump from where you are now for minimal money spent. This is utilizing risk management.

Sewer improvements would include liners and terminal manholes. This would be an in situ liner which is extremely less disruptive than digging up a line: it is done with high pressure steam through the manhole and pipe and pushes the in situ liner through, which has a resin that cures in place when heated to a certain temperature. You virtually have a brand new line and they can go in and cut out all your services. You have a really good fix for a lot less money. Once lined, you would have virtually the same life as from digging it up. Yearly maintenance would be about the same.

There was an explanation of curb-to-curb, ground down full-depth new pavement. They would want to minimize water sheeting.

The estimate for the water system without risk management is $1.4M as opposed to $186,000 with risk management. After mitigation, it is likely that you would have another 30 years of service with that. Until about 5 years ago, he would have said if you have 100 year old pipe you need to replace it, but now with condition analysis and statistics, you have an opportunity to get more life out of that pipe because we have more information.

Councilor Witham asked if we have the capacity in the downtown if we had more business in the downtown, for sprinklers, etc. The answer was that we have the capacity. Mr. Thibault said it is really the Council's appetite for risk; it is 100 years old. If you can live with a couple of breaks, you are saving yourself money that can be spent in other areas, high risk and high probability. They offer the information; the decision is up to the Council.

Councilor Witham said it is fair to say that there could be a break the day they put in a new system, as well.

The bottom line estimate for the work without risk management is $3,787,565 as opposed to $2,206,119 with risk management assessments.

City Manager Belmore said $2,206,119 is a very real number that the Council might want to take a serious look at.

The presentation was closed at 6:40 pm.