
**EXECUTIVE SUMMARY
MAYOR AND BOARD OF ALDERMEN**

Submitted By: Gene Walzl, Project Mgr. Utilities - Eng. Dept.

Date: 2/08/2019

Presented By: Gene Walzl

Other Staff Present:

Zack Kershner, Director of Public Works
Tracy Coleman, City Engineer
Joe Adkins, Deputy Director for Planning
Rachel S. Depo, Assistant City Attorney

Meeting Dates

Workshop: 10/3/2018
 2/20/2019

Agenda Item: Discussion of the City's Adequate Public Facilities Ordinance (APFO)—
Water and Sewer Capacity

Background Information:

General

In October 2018, Staff initiated a discussion of the Adequate Public Facilities Ordinance (APFO) as the first in a series of workshops focusing both on the general application of the ordinance as well as on the individual components of the APFO. This workshop will focus on the Water & Sewer system capacity requirements, Sections 4-9 and 4-10 of the Code respectively. The Water Treatment Capacity (Section 4-13) and Sewer Basin Treatment Capacity (Section 4-14) portions of the Code, which are regulated in detail by the Water and Sewer Allocation and Impact Fee Ordinance, Section 25, Article IX, will not be a part of this discussion.

1) Purpose

The objective of the APFO testing for Water and Sewer capacity is to prevent overloading of system components due to additional proposed demand. The facilities designed to be used by the proposed development must take into account current as well as future demand.

2) Exemptions

As discussed in previous workshop sessions, exemption of the testing requirement for W&S APFO applies to all City projects, smaller residential projects, certain developments on lots of record with approvals granted prior to 2007 and for residential lots with allocation contracts executed prior to 2007.



Should all development and redevelopment projects be subject to APFO testing? Increasing levels of apparent impact could be held to higher standards of proving adequate capacity.

3) Process

In conjunction with planning and design of a non-exempt development project, the consultant is required to submit a report which provides sufficient information to demonstrate what effect the added demand poses on the water system and sewer system components affected by the development.

For water, the elements under examination include transmission and distribution pipes, pumping stations and storage tanks. Pressure and flow volumes in the piping system are calculated for given loading conditions and compared to acceptable limits.

The sewer system components to be studied include interceptors and collector pipes within the sewer drainage area and pumping stations where applicable. The amount of sewer flow in the affected piping network is calculated for a given loading condition and the result is compared to the acceptable limit. If the area to be serviced requires the use of a pumping station for sewage not able to be conveyed by gravity, the pumping station flows are calculated and compared to the known capability of the station.


4) Testing Thresholds


The accepted industry-standard thresholds for water system testing are:

- (1.) To maintain a minimum pressure of 20 pounds per square inch (psi) for system customer demands on max day with a fire flow of a required amount. For the City, max day demand has been determined to be 1.6 times the average day customer demand.
- (2.) To maintain a minimum system pressure of 35 psi for customer demands on peak day flow, which is 4.0 times the average day customer demand.

For gravity sewer system testing, the threshold is to contain peak day sewer demand (4.0 times average day) and calculated Inflow & Infiltration (I&I) flow within the piping network. Calculations are generally presented which show a value for remaining capacity in each downstream sewer line with the expectation of a positive remaining capacity value.

Consideration is also given to areas of known system performance issues such as infrastructure age/condition and also excessive I&I.

 *Can staff develop a better method of conveying information regarding field performance issues, i.e., show areas of significant I&I occurrence?*

 *Should smoke testing of sewer lines in areas of known significant I&I be required by the developer as a procedural step in determining the adequacy of the sewer system?*

5) Typical Improvements


If, after reviewing the APFO report and/or being alerted to relevant system issues, the Engineering Department finds that there are deficiencies, corrective action is required as a condition of APFO approval. The type of corrective action varies based on the severity of the deficiency and the impact of the remedial action to be taken. In some cases, the City is aware of the potential issue and has plans for improvements (short and long term) as may be listed in the CIP or recommended in pertinent Master Plan Studies.

Where needed, water system corrective action generally involves upsizing of a critical main which may be of insufficient size to deliver the proposed demand or which may be older and constricted with corrosive material on the interior of the pipe. For large-scale main replacement projects, the developer may be required to make a monetary contribution toward the total cost in proportion to the impact of the demand and the scale of the project.

Sewer issues have predominantly involved areas of higher-than-normal I&I. In these cases the pipe's designed capacity is reduced significantly by the I&I and the developer is required to line the affected sections of pipe or make a monetary contribution toward the City's continuing effort to do this. On rare occasions the line was not originally sized to accommodate the demand of the proposed development and must be replaced with larger pipe.

6) Policy Challenges


There are three major areas of concern that pose challenges to the process of system analyzation by the developer's consultant. In almost all cases, the question of how to determine the scale of the affected portion of the system is asked. Depending on location of the project within the system and the demand quantity, the extent of the affected system can vary widely. A moderately small demand located within a relatively young, robust part of the system may have an insignificant impact on the capacity of the infrastructure and thereby reduce the degree of study area required. But that same demand proposed in an area of the system that is older and possibly weaker (smaller) may have an impact on a larger segment of the system. This is often true of projects located in certain portions of the downtown area.

 *Considering the age and general condition of most of the water and sewer infrastructure in the downtown area, should reliability be a factor in determining the adequacy of the system(s)?*


Related to the first issue is the availability of information regarding system components that may need to be incorporated into the study. Data required for the analysis is less likely to be available or clear in older sections of the system(s) than those that have been more recently installed. Existing demand data is not readily obtainable nor is the condition of existing piping. These factors, which are instrumental in determining system capacity, must often be estimated to the best of the consultant's ability, providing a source of possible inaccuracy in the study findings.

The third area which poses a challenge to the consultant is the familiarity with the general functions of the infrastructure within the City of Frederick. Similar to a mechanic's expertise in checking the performance of a certain vehicle model, the consultant may also be challenged when presented with a water or sewer system with which they are not familiar. Anecdotal information from field crews and other staff may also provide valuable insight into the performance capability of the system or the lack thereof.

There have been several professional engineering consultants that have studied various parts of the water and sewer systems and have managed to apply the experience gained to overcome the challenges. It may be an advantage to both the development community as well as the City to utilize the expertise of these professionals in answering the system capacity question in a swift and efficient manner.

 *Should APFO analyses be performed by a consultant hired by the City for such purpose?*
Related question is: Given that the analysis is currently performed by the developer's consultant, should the City retain the services of an independent consultant to review/evaluate the submitted APFO reports?

Computer modeling of water and sewer piping systems has become a valuable tool in assessing the performance of the infrastructure. The consultant for the 2006 Water Master Plan developed a computer model of the City's water system and the upcoming Sewer Master Plan Update will include a sewer model as well. Properly maintained and regularly updated with new input data, the use of these tools could provide a very useful mechanism for addressing the challenges of APFO report compilation and/or approval.

 *Is it possible to permit the use of the City's computer model(s) by private engineering consultants for the purpose of studying the adequacy of water and sewer systems in preparing APFO reports?*

Committee Recommendations if Applicable: N/A

Fiscal Impact: N/A

Recommendation: N/A

Supporting Documentation:

Director: _____ **Date:** _____

Concurrence Needed:

	Initials	Date	Email
<input checked="" type="checkbox"/> Legal:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Budget:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Finance:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Purchasing:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Public Works Operations:	_____	_____	<input type="checkbox"/>
<input checked="" type="checkbox"/> Engineering:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Parks and Recreation:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Planning:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Police:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Human Resources:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Economic Development:	_____	_____	<input type="checkbox"/>
<input type="checkbox"/> Other:	_____	_____	<input type="checkbox"/>