In 1992, the United States Congress passed, and President George H. W. Bush signed, the Energy Policy Act. This Act made law that all plumbing fixtures in the United States meet a maximum allowable flow-rate standard. The maximum flow-rate established for toilets was 1.6 gallons per flush (gpf). This was quite a change from older toilets that until 1992 had operated with anywhere from 3.5 to 7.0 gpf.

While striving to meet the requirements of this new law, toilet manufacturers were forced to rush a product to market. This first generation of low-flow toilet was quite disappointing. That is why chances are if you have ever heard mention of a low-flow toilet, you have heard a complaint.

Anyone moving into a home built in the early 1990's or renovating a bathroom was exposed to this new type of toilet. They quickly became disappointed at how poorly the bowl cleared, and found that frequently two to three flushes were required.

This additional flushing in many cases actually resulted in an increase in water usage over older models. People soon began talking of a "black market" where higher-flow toilets could be purchased to replace these less efficient low-flow types. Society as a whole became united in their complaints of these fixtures. The outcry was so strong that Congress actually considered repealing the Energy Policy Act.

Fortunately, before that was necessary, toilet manufacturers had begun developing and releasing second and third generation low-flow toilets and with these newer varieties they had worked out many of the problems, making multiple flushes unnecessary.

If you still hear complaints about low-flow toilets, chances are they are coming from people who have one of the first generation low-flow toilets. Currently there are a few different types of low-flow residential toilets on the market, all of which operate at least as effectively, if not more than older, higher-flow types.

The standard is the gravity flush toilet. This toilet is the least expensive to purchase, install and maintain. It is the toilet with which most people are familiar. The weight of the water as it flows from the tank into the bowl is what causes the bowl to empty. Occasionally these toilets do not perform as well in removing solid waste.

A type that is more costly to buy and maintain, but has a better performance record is a pressure-assisted toilet. Air that is compressed by the pressure of your home's water lines is used to force water into the bowl, clearing it. These toilets are louder than gravity types as they make a "wooshing" noise when the

water pushes into the bowl. Another drawback is that 25 pounds of pressure per square inch is required, and some home's plumbing may not meet this requirement.

The vacuum-assisted toilet is another low-flow type available in today's market. This toilet has installation and maintenance costs similar to a gravity toilet. It works when vacuum chambers in the tank pull water and waste from the bowl.

The fourth type of low-flow toilet available is the pump-assisted. This toilet uses a pump to force water out of the tank and into the bowl. It is very similar to a gravity toilet in that the water's weight is a factor in clearing the bowl. One drawback of this toilet is that electricity is required to operate the pump.

Despite the improvements made to low-flow toilets, many still argue that upgrading to one is unnecessary. Consider though that installation of a low-flow toilet can result in interior water savings in excess of 15%.

Savings can be even greater if your older toilet has a leak. A leaking toilet can waste hundreds to thousands of gallons of water each month without being noticeable.

If you still are not ready to upgrade to a low-flow toilet, take steps to make your existing toilet more efficient. Displacement bags can be used in the tank to reduce the amount of water used with each flush. Do not use a brick as a displacement device, as they will erode and cause damage to the workings of the toilet. You might also consider using an early-closing flapper valve, which will also reduce the amount of water needed for a flush. Be sure to check your toilet regularly for leaks. Add a few drops of food coloring to the tank and wait ten minutes before flushing the toilet. If color ends up in the bowl, your toilet is leaking and needs to be repaired.

If you would like to upgrade to a low-flow toilet, check with your local water utility. Many have rebate programs for which you may qualify. Albemarle County Service Authority customers can qualify for up to $300 in rebates for replacing older toilets with new, low-flow types. Visit www.acsanet.com to see if you qualify. City of Charlottesville public water customers should check with the Utility Billing Office to find out more about their rebate program.