

# Roundabouts in Harford County, Maryland

## A Local Perspective



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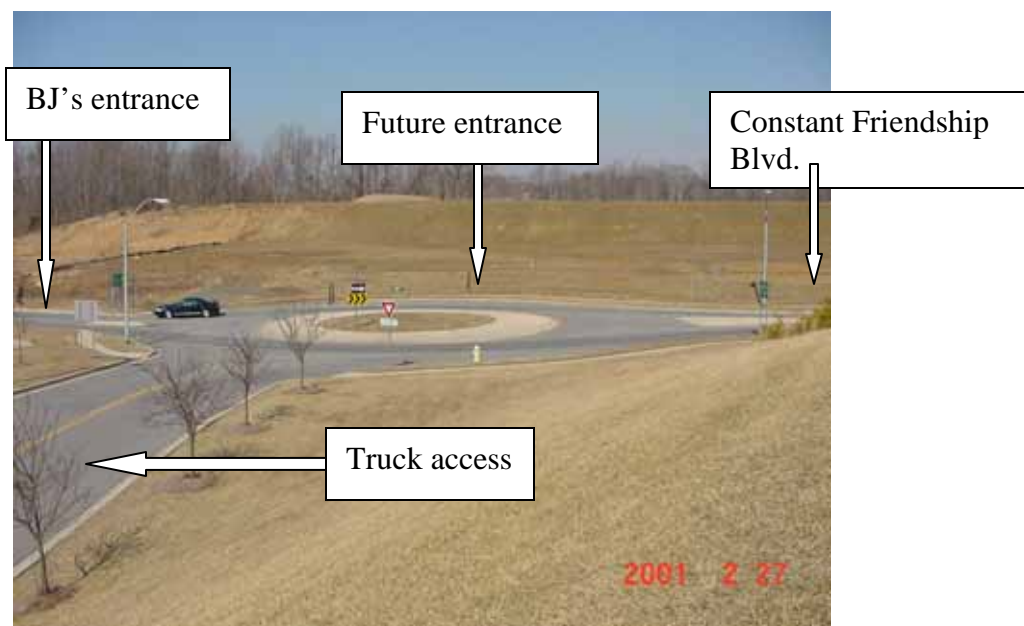
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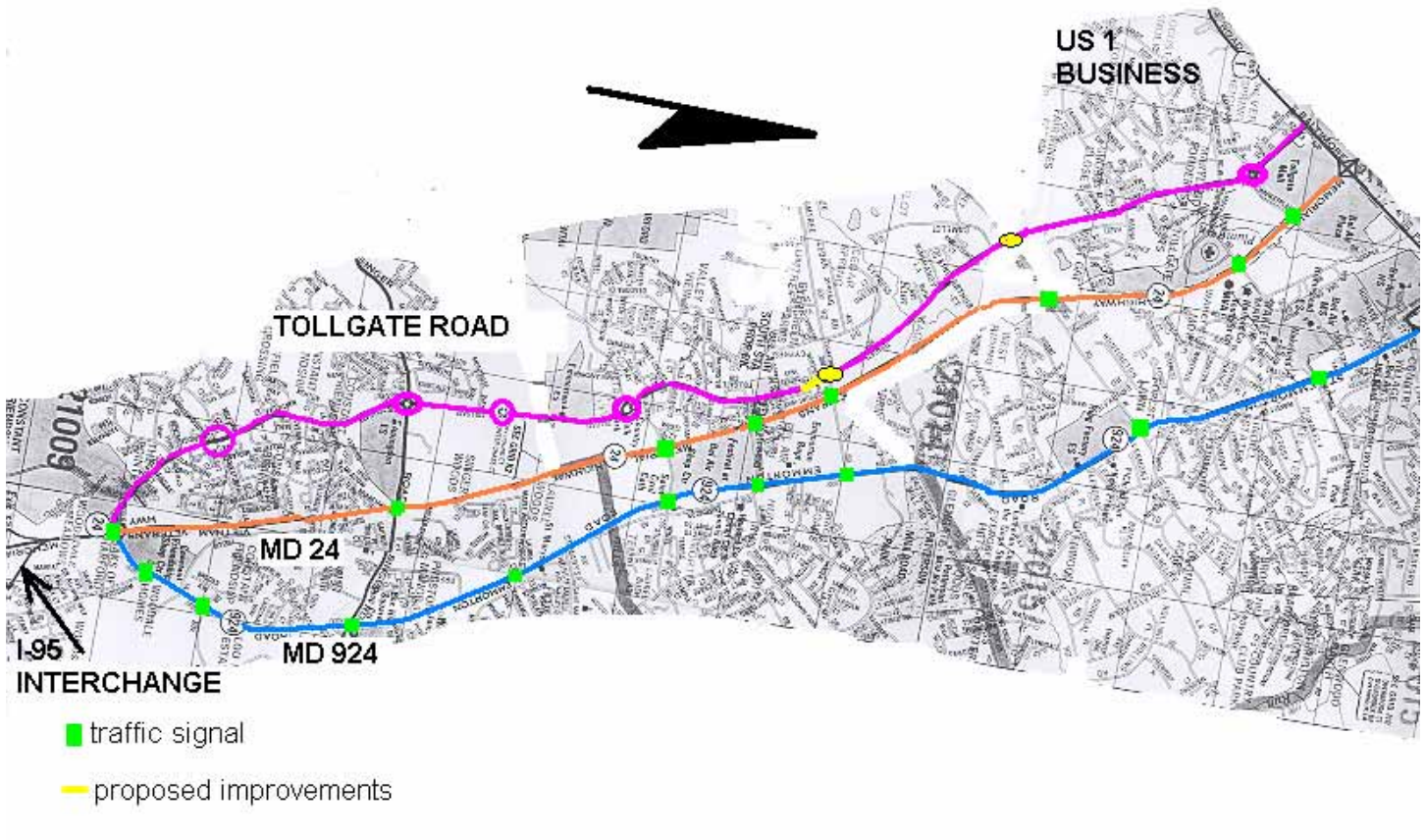
Harford County, Maryland is part of the Baltimore Metropolitan region and is home for over 225,000 residents. The County maintains over 1,000 miles of roads, and started using roundabouts in 1995 as a means to control intersection capacity, increase intersection safety, and maintain the residential integrity of the roads where they are located. Currently, there are 16 roundabouts in Harford County, 14 of which are located on Harford County controlled roadways and an additional three under design.

All of the roundabouts on County roads are constructed with curbing around the perimeter and have a design speed of fifteen miles per hour. The majority of them have a 15' wide travel lane, a 15 foot wide truck apron and a 40' - 50' diameter center island that may be landscaped. We changed our signs on the outside edge of the splitter islands to only install flex posts at the request of the fire department to accommodate ladder trucks. Several of the center islands are landscaped and maintained by local businesses or communities. Before they are landscaped, a plan must be submitted and reviewed by the County's Grounds Maintenance Supervisor to ensure the proposed landscaping will not restrict sight distance and that the root systems of the plantings will not create a maintenance problem with the curbing around the island or with the truck apron. Additionally, the business or community is permitted to install a sign indicating that they sponsor the landscaping and maintenance, but the signs can not restrict sight distance and must be constructed as a breakaway structure. Reflectors have been added on the approach sides of the splitter islands to improve visibility.

The County's first roundabout was constructed in the Constant Friendship Business Park, at the end of a cul-de-sac in 1995. There were two entrances into BJ's Warehouse, and one access to the adjacent lot proposed from the cul-de-sac. We felt the roundabout would effectively control access to the lots and introduce Harford County drivers to the concept of roundabouts.



The roundabout worked well and, as a result, it was decided to consider using them in other locations. The first location considered along a major roadway was on a major collector road, Tollgate Road that parallels Maryland Route 24 between I-95 and the Town of Bel Air. The Maryland 24 corridor is part of the designated growth area for Harford County. Tollgate Road intersects Maryland Route 24 just north of I-95 at a four-legged intersection that also includes MD 924. Both Tollgate Road and MD 924 veer northward after their intersection with MD 24 and then parallel MD 24 for approximately five miles to the Town of Bel Air. The population in the MD Route 24 corridor has increased by 34% in the past decade, and is expected to increase by an additional 19% by the year 2020. Currently, the ADT on MD 24 just northwest of the I-95 interchange is 64,800.



The ADT's on MD 924 and Tollgate Road are 22,700 and 10,800 respectively. The ADT on Tollgate Road is expected to increase to over 18,000 when a missing segment of the roadway (approximately 1,500' long and in the middle of the corridor) is constructed by a developer and the entire roadway between MD 24 and US 1 Business becomes a useable commuter route. There are 8 traffic signals on MD 24 and 10 on MD 924 between the I-95 interchange and US 1 Business, which raised the following concerns regarding Tollgate Road:

- Tollgate Road primarily connects residential communities, two elementary schools, a new hospital, a new library and limited commercial developments  
Tollgate Road is a collector road that parallels MD Route 24 between I-95 and the Town of Bel Air.
- Once Tollgate Road is complete between MD Route 24 and Business Route 1, the intersections with other collector roads that also connect to MD Route 24 are projected to have failing levels of service.



- Concerns were expressed that delayed traffic on MD 24 and MD 924 may consider bypassing those delays by speeding down Tollgate Road.

In an effort to maintain the residential character of Tollgate Road, while reducing speeding and controlling the volumes of traffic at the major intersections...a series of roundabouts was proposed for the entire Tollgate Road corridor. As a result of that effort, five roundabouts have been constructed along Tollgate Road since 1996, two more are in design and at least one more is proposed.

The first roundabout constructed along the Tollgate Road corridor was at Marketplace Drive, in 1996. Marketplace Drive accesses a commercial development to the east and also connects to MD 24. The developer for the site was given the option of installing a signal with additional road widening to accommodate turning movements or to construct a roundabout for his access onto Tollgate Road. The signal and improvements, including the relocation of several large utility poles would have cost approximately \$220,000. The roundabout option actually involved narrowing the roadway on the approach to the roundabout and was estimated at about \$92,000. The developer chose the less expensive option and the roundabout was constructed as shown in the photo below. Note the offset to avoid impacts to the existing residents on the right side of the picture.



Tollgate Road/Marketplace Drive

There have been 3 reported accidents at this location. Two were single vehicle accidents; one driver was under the influence of alcohol and got stuck in the island in the middle of the roundabout and the other wasn't paying attention, hit the curb of the splitter island and blew out a tire.

The roundabout was monitored for approximately 12 - 18 months before deciding that the accident history and it's ability to easily control traffic flows warranted the inclusion of more roundabouts in the County's road network.



Tollgate Road/Singer Road Roundabout

Based upon the success that was experienced with the Marketplace Drive roundabout, the County began investigating additional installations. The roundabout at Tollgate Road and Singer Road was constructed in 1998. It was also constructed by a developer who was adding the forth leg of the intersection, the extension of Tollgate Road for approximately ½ mile to the north. Singer Road is another major collector road in the County and there have been no accidents reported at this location. The roundabout was suggested by the County to accommodate projected volumes on both roadways and to eliminate the concerns associated with the slight over vertical curve along Singer Road. The vertical curve contributed to reduced sight distance at the original three-legged intersection and may have been a factor in several accidents.

The ADT on this section of Tollgate Road is over 10,000 and 3,000 on Singer Road. The ADT is expected to increase to over 18,000 on Tollgate Road when the road is complete between MD 24 and Business Rt. 1. The ADT on Singer Road is expected to increase with additional development in the area.



Tollgate Road/Wheel Road Roundabout

The roundabout at Tollgate Road and Wheel Road was constructed in 1999. Since it was the intersection of two existing County roads, it was 100% funded by the County. There have been three reported accidents at this location (all very minor in nature). Wheel Road is a major collector road in the County. An elementary school is located in the area and some of the children walking to school must cross the roundabout. School buses easily navigate the roundabout and school children are assisted across by a crossing guard. The roundabout was landscaped by an Eagle Scout candidate in August 2000.





Tollgate Road/Montrose Way Roundabout

The roundabout at Tollgate Road and Montrose Way is located between Singer Road and Wheel Road, two collector roads. It was constructed by the developer of a major subdivision of approximately 1400 housing units as a requirement of the approval process. This was the same developer that constructed the Singer Road / Tollgate Road roundabout. There is an elementary school and library located just north of the roundabout, and another elementary school to the south.



Tollgate Road/Westover Lane intersection



Tollgate Road/Westover Lane Roundabout

At the intersection of Tollgate Road and Westover Lane, there were 25 accidents, including 2 fatalities between January 1995 and September 2002. Although there was adequate sight distance for the posted speed limit, many accidents were caused by vehicles pulling out of the side street in front of on-coming traffic. In a first for Harford County, the community association actually contacted the Dept. of Public Works and requested that a roundabout be installed at the intersection to increase the safety. The roundabout was constructed in 2002 and

there have been no reported accidents at this roundabout, attesting to the safety aspects associated with roundabouts.



Prospect Mill Road/Wagner Road Roundabout

Prospect Mill Road is another major collector road in Harford County. A developer proposed to construct a 115 single family lot subdivision, accessing onto Prospect Mill Road. Originally a three-way intersection was proposed for the access. However, due to a large volume of traffic on Prospect Mill Road, and limited sight distance, the County agreed to share the cost to install a roundabout. There is an over vertical curve approximately 300 feet north of the roundabout, which restricted the approach sight distance. Additionally, the intersection was situated on an 8% grade. The roundabout was “benched” into the grade and now has a cross section slope of about 3.5%. Due to concerns over the reduced sight distance on the approach, additional and oversized advanced warning signs, as well as pavement markings were added on the southbound approach. The roundabout was constructed in 2002 and there have been no reported accidents.

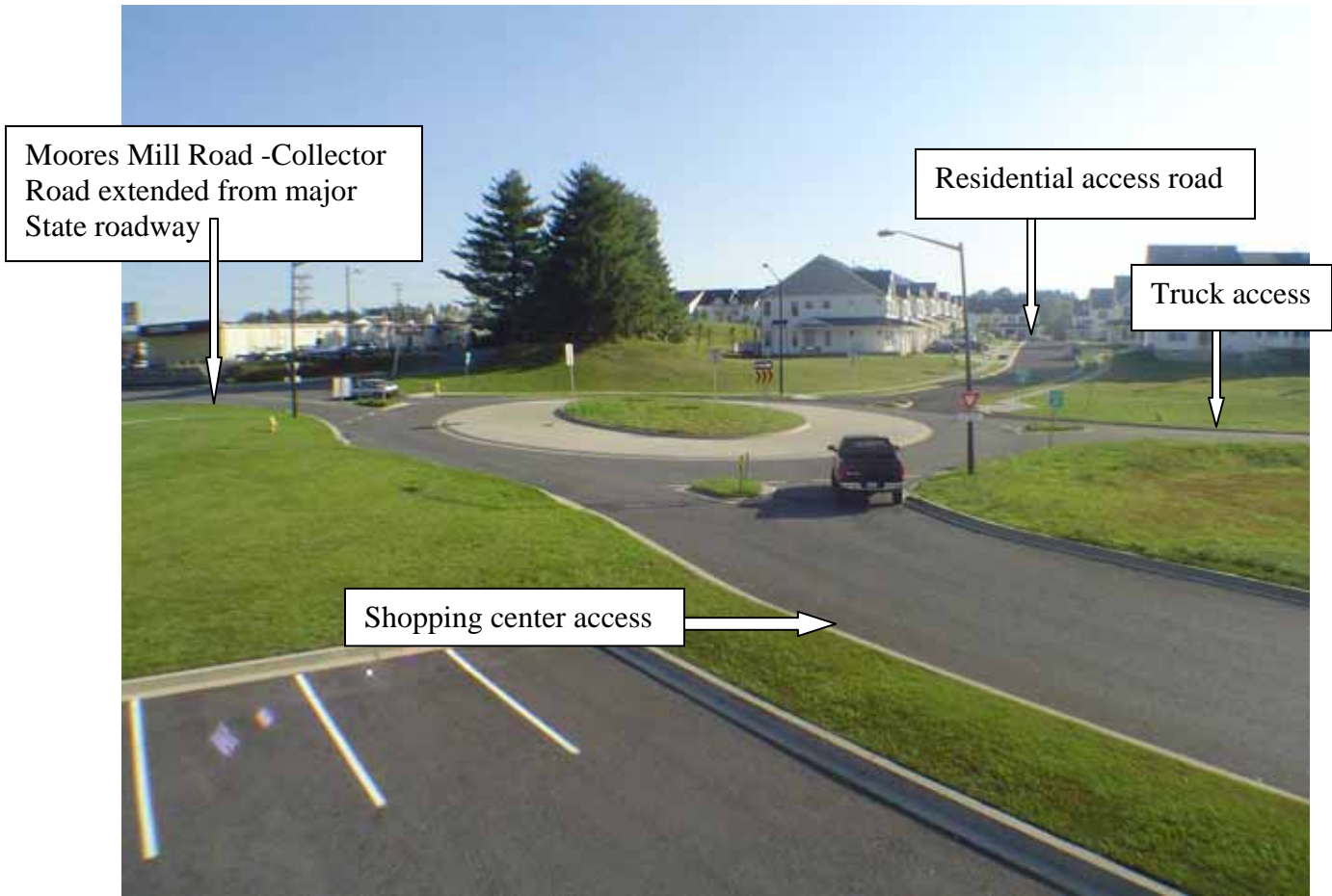


Over-vertical curve approaching Wagner Road



Advanced roadway markings and signing





Moores Mill Road/Brushing Lane Roundabout

At the end of Moores Mill Road, a developer wanted to construct a large cul-de-sac to access a shopping center and a residential townhouse community. The County felt that it would create a traffic hazard due to the many turning movements and lack of control, so we required the developer to construct the above roundabout. It was constructed in 2001.

As more roundabouts were constructed in the County, local developers started to include roundabouts in the designs of their proposed subdivisions.



Cokesbury subdivision concept plan design included a roundabout



Roundabout currently under construction (Sept. 2004)

This roundabout has a fifteen foot travel lane and only a three foot truck apron. This design was originally considered as a variation on the roundabout design for this subdivision, since most of the traffic would be residential. However, it appears that the reduced truck apron, narrow entrance and exit road widths and inadequate radii on the approaches and exits are creating a situation where many trucks are jumping the curbs. Therefore, this type of design is not recommended without revisions and additional design analysis.



Mardic Drive/Willrich Ct. Roundabout - Constructed in 2001

The Mardic Drive / Willrich Court roundabout was the first proposed by a local developer to enhance the neighborhood and provide for safer access. They initially had problems with trucks driving through the center island, but additional landscaping has alleviated the situation.

The roundabouts are being constructed as part of the developers' desire to prevent future traffic problems at multi-way intersections and to provide an attractive entrance to the neighborhood. One developer opted to construct a residential roundabout in the Stone Ridge subdivision. Although it has created some confusion about which way to navigate it since it has no splitter islands, there have been no reported accidents at this location.



Stone Ridge Way/Windwood Road Mini Roundabout

Two of the County's existing roundabouts are on State roads. One is located on Maryland Route 7, which carries a significant amount of truck traffic between I-95 and the Perryman industrial area. However, there are also a large number of residents along this portion of the road. The residents wanted something to slow the speeds of the trucks through their neighborhood. The Maryland State Highway Administration agreed to install a roundabout at the main entrance to a new residential development with 1090 planned units. Maryland Route 7 is an open section road that has an average daily traffic volume of 11,475. The biggest problem with this roundabout is that it was constructed as an open section roadway without shoulders, and many of the trucks are cutting the corners to avoid reducing speeds, thus creating significant rutting problems adjacent to the road.



Maryland Route 7 Roundabout



Harford County continues to pursue the construction of roundabouts at appropriate locations. Among several locations on County roads, there are two more roundabouts planned along Tollgate Road. One is scheduled for construction in the spring/summer of 2005 at the intersection of yet another major collector road, West Ring Factory Road. There have been 16 accidents at this location between June 1998 and March 2004, including a fatal accident. There have also been numerous requests for multi-way stop signs.

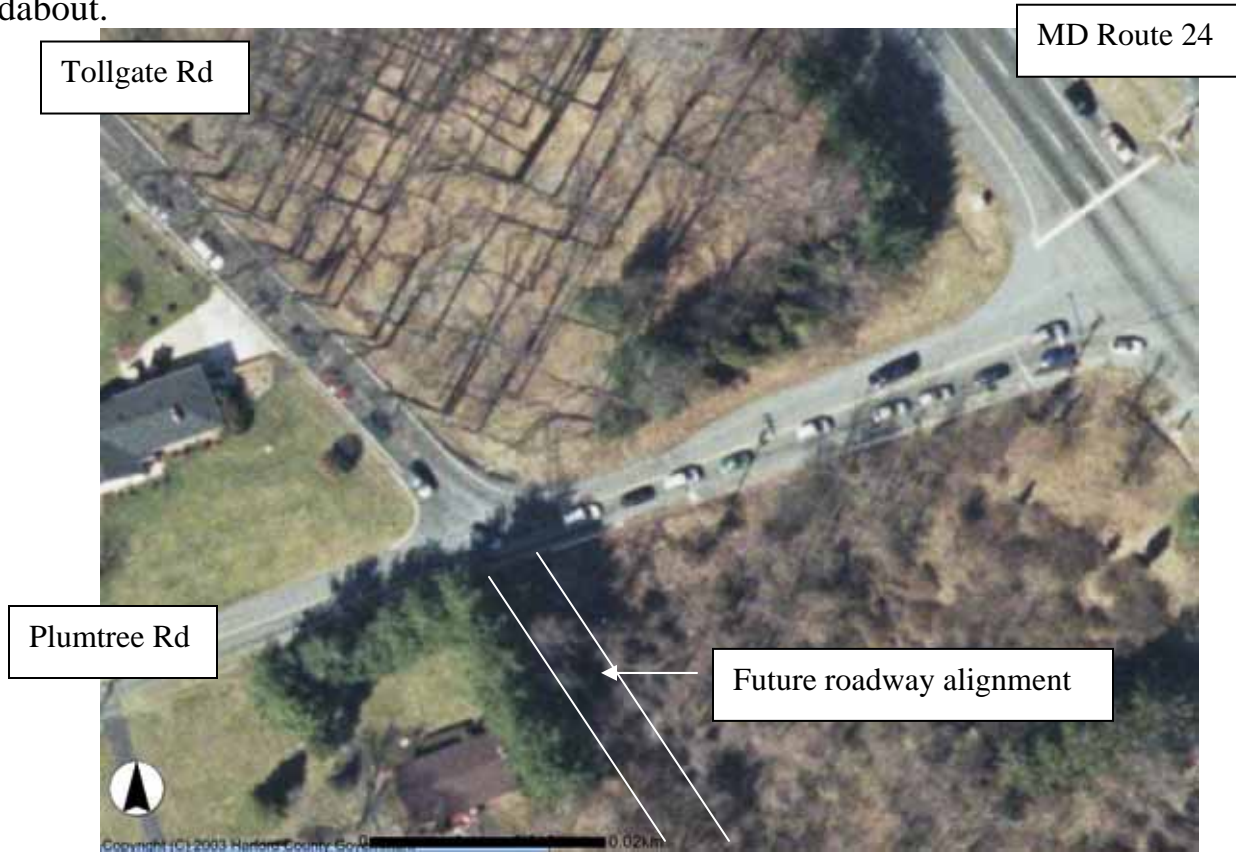


The existing intersection has a two-way stop condition on Ring Factory Road. Ring Factory Road is thirty six feet wide, and although it is striped as a one lane approach, vehicles were using it as a two-way approach. This contributed to many of the accidents, since the sight distance of vehicles going straight or making left hand turns was restricted by the right turning vehicles. As an interim improvement until the roundabout is constructed, temporary curbing was installed in a choker configuration at the intersections, creating a one lane approach.



Temporary curbing on side road approaches

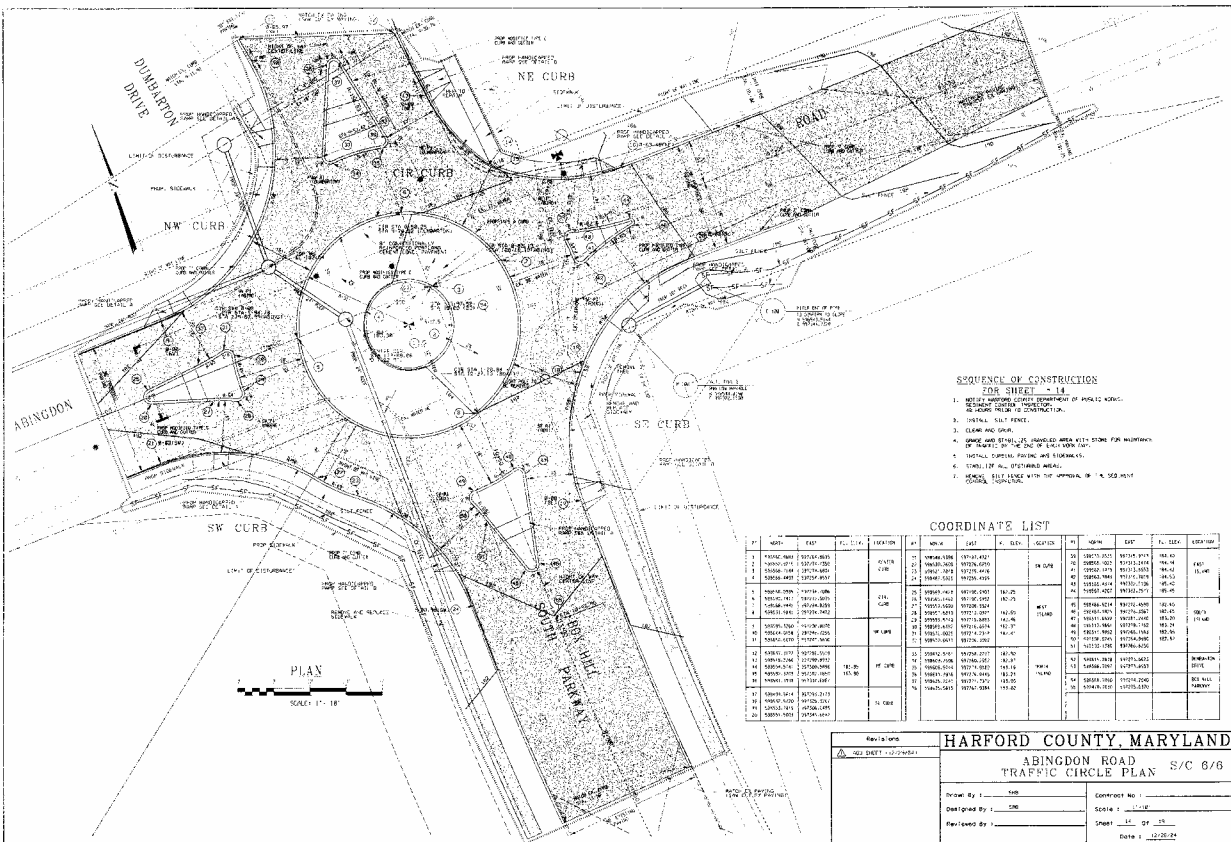
Additionally, another roundabout is planned at the Tollgate Road/Plumtree Road intersection when the final link of Tollgate Road is constructed. At that time, the access from Plumtree Road to Maryland Route 24 will be eliminated due to its close proximity to the proposed roundabout.



Another roundabout scheduled for construction in the spring/summer of 2005 is at the intersection of Abingdon Road, a major collector, Box Hill South Parkway and Dumbarton Drive. This intersection is in close proximity of one of the Volunteer Fire Stations, and is one of their primary routes. Therefore, several design concessions were made to accommodate the wishes of the fire department in exchange for their approval of the location. The proposed roundabout will have an eighteen foot travel lane as well as an eighteen foot truck apron. This location will be closely monitored after construction to see if the extra widths affect the operation and speeds of vehicles in the roundabout.







proposed design



## Roundabouts in Harford County on County roads

Location	Year constructed	# accidents
1. Constant Friendship Blvd/BJ's	1995	0
2. Tollgate Road/Marketplace Drive	1996	3
3. Tollgate Road/Singer Road (by Developer and County)	1999	0
4. Tollgate Road/Wheel Road	1999	3
5. Tollgate Road/Westover Lane	2002	1
6. Moores Mill Road/Brushing Lane (by Developer)	2001	0
7. Mardic Drive/Willrich Ct. (by developer)	2001	0
8. Prospect Mill Road/Wagner Farm Rd (by Developer)	2002	0
9. Stone Ridge Way/Windwood Road (mini) (by Developer)	2002	0
10. Tollgate Road/Montrose Way	2003	0

Six of the accidents were single vehicle accidents, two of which were alcohol related, and one involved a stolen vehicle. The accident involving two vehicles occurred when a driver from another country did not yield to the police car already in the roundabout.

Under construction:  
(All by developers)

1. Cokesbury subdivision – Tewkesbury Rd/Shrewsbury Rd
2. Hollywoods subdivision (2) – Holly Oaks Cir/Burnt Hill Trail,  
Holly Oak Cir/Shingle Oak Ct.
3. Wexford subdivision – Ashford Drive/Tralee Circle

Under design (by County)

1. Tollgate Road/Ring Factory Road (construction spring/summer 2005)
2. Abingdon Road/Box Hill S. Parkway/Dumbarton Drive (construction spring/summer 2005)
3. Tollgate Road/Plumtree Road (construction dependant on Developer's schedule)

Although there have been a few design elements that are not considered ideal, the roundabouts in Harford County have been a very effective tool in improving traffic safety for the motorists in Harford County and will continue to be considered for future locations where warranted.