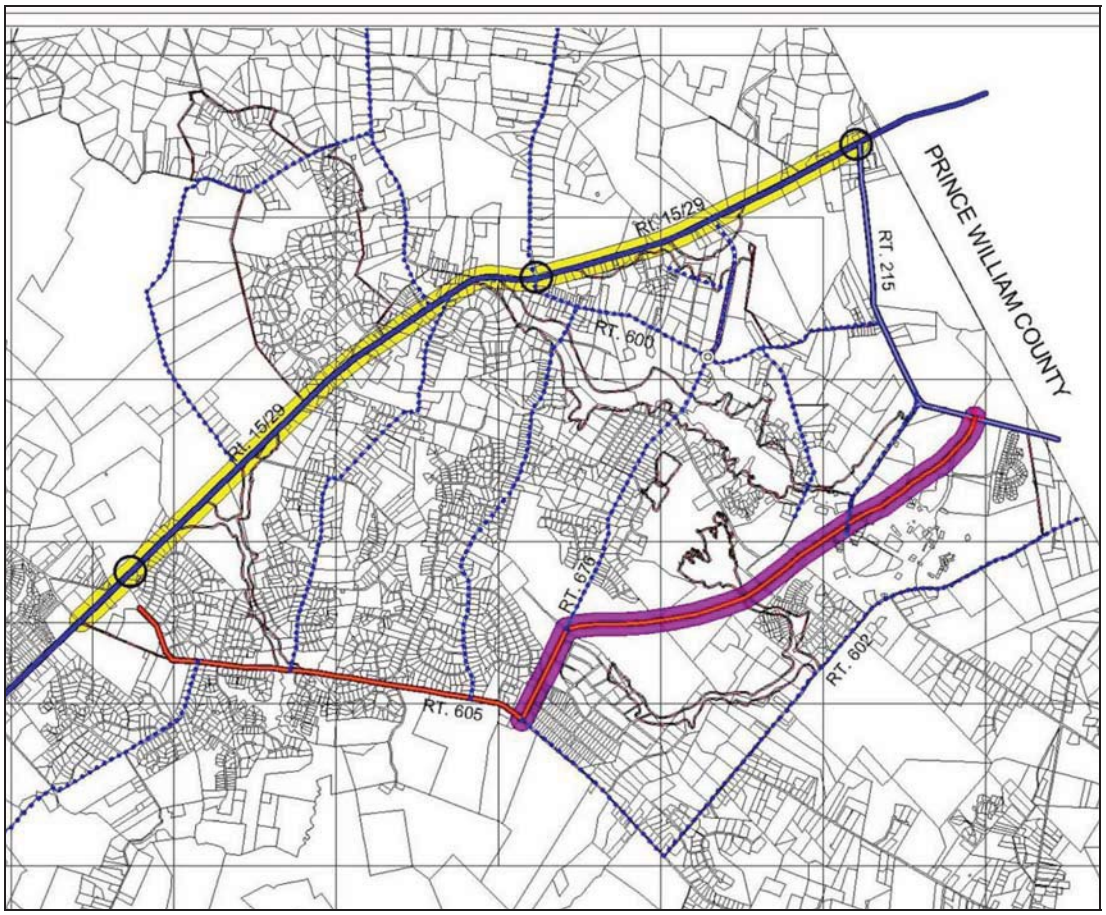
Route 29 North
Warrenton to Prince William County
Access Management Study



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Warrenton to Prince William County Access Management Study

The overall purpose of this study is to develop recommendations for the potential roadway improvements to improve the safety and capacity of Route 29 between Warrenton and Prince William County. Previous studies have recommended improvements to Route 29 that included widening to six lanes, grade separated intersections, and building or expanding bypasses. However, roadway widening and grade separated interchanges are inconsistent with the historical, cultural, and aesthetics of the corridor. The designation of this section of Route 29 by the Journey Through Hallowed Ground Partnership as one of the most sensitive areas emphasizes the importance of finding a context sensitive transportation solution.

The existing roadway section is a four-lane divided highway with wide medians and numerous crossovers and at grade intersections as well as right turn lanes. Currently there are two signalized intersections at Route 29/Broad Run Church and Route 29/Vint Hill Road. Signalized intersections are being considered for Route 29/Riley Road and Route 29/Cross Creek (Cross Creek currently does not exist but may be built to serve a future commercial area). Six lane sections exist at each end of the Route 29 section under study.

Based on VDOT traffic estimates, the existing Average Daily Trips for the roadway section is approximately 45,000. There is a heavy directional flow that corresponds with the AM and PM peak periods of travel. The peak flows are heavy in the northbound direction in the AM and a heavy flow in the southbound direction in the afternoon. This is consistent with the flow of commuter traffic.

Existing Conditions:

Several field reviews were conducted during the study. At the Broad Run Church intersection, large southbound queues extended to Riley Road. Based on observation, the southbound queues result from not providing enough green time for the through movement and a rise in grade approaching the intersection that reduces the capacity. Green time for the Route 29 through movement is reduced to provide sufficient capacity for left turns and Broad Run Church movements.

At the intersection of Route 29/Vint Hill Road queues create a hazard due to the poor sight distance of approaching northbound Route 29 traffic. Again queues were formed due to insufficient green time for the northbound through movements.

Also in the corridor many of the driveways do not meet VDOT's driveway and median opening spacing standards. The lack of proper driveway and median opening spacing creates more conflicts, lowers the free flow speed, reduces the through movement capacity, and increases vehicle delay.

Potential Improvements:

In order to minimize the future transportation improvements that may be necessary to maintain an acceptable Level of Service in the corridor, various alternatives and intersection treatments have been considered. Based on field observations, the key to maintaining a reasonable flow of traffic will be the design of Route 29's intersections.

Currently, Route 29 is a four-lane divided highway. Typically a four lane divided highway with uninterrupted flow which follows VDOT's access management regulations would be able to service an average daily trip volume of 70,000+ passenger cars. The key for Route 29 to handle high traffic volumes and remain a four-lane facility without intersection grade separations is to minimize the signalization in the corridor and eliminate the bottlenecks at the intersections.

The initial set of improvements considered for the corridor included a combination of roundabouts, directional left turns, crossover u-turns, crossover closings, and driveway consolidations. The plans for the proposed improvements are shown in Appendix A. Descriptions of the improvements are as follows:

1. Route 29 / Vint Hill Road (SR 215)

Currently, the intersection of Route 29 / Vint Hill Road (215) is signalized and is experiencing delays during the peak hours. In the northbound direction, due to poor stopping sight distances a hazard is created when vehicles form queues. Various safety warnings have been installed to warn approaching vehicles of the queued vehicles.

The proposed improvement for the Route 29 / Vint Hill Road (SR 215) intersection is to construct a directional left (See Figure 12 in Appendix A). The directional left would permit US 29 southbound left turns on to Vint Hill Road. Vehicles from Vint Hill that wanted to go southbound on Route 29 would use the channelized right and make a u-turn at a crossover approximately 1000 feet north of the intersection.

The directional left at Route 29 / Vint Hill Road (SR 215) would eliminate southbound Route 29 traffic from stopping at the intersection. It would be a free flow operation and provide the capacity for the forecasted 2035 traffic. Northbound Route 29 traffic would be signalized to allow the left turning Southbound Route 29 traffic on to Vint Hill Road. However, the amount of green time needed for the left turn movement would be significantly less than the existing green time needed for the minor street movement and the capacity northbound on Route 29 would be increased proportionally. The increased capacity in the northbound direction would reduce the queues and reduce the hazard created by the short stopping sight distance in the northbound direction.

2. Route 29 / Riley Road

The proposed improvement for the Route 29 / Riley Road intersection is the construction of a two-lane roundabout with three approach legs and an inscribed diameter of 180 feet.

There are two alternative designs for the proposed roundabout at Riley Road.

Alternative B is a roundabout that requires all vehicles from Riley Road to enter Route 29 on a channelized right turn and merge with Route 29 traffic. Vehicles from Riley Road that want to go southbound would make a u-turn at a designated Route 29 median crossing approximately 1000 feet north of the roundabout.

Alternative A is a roundabout that would allow Riley Road vehicles that wanted to go southbound on Route 29 to enter the roundabout. Northbound Riley Road traffic would enter Route 29 from the channelized right turn and merge with Route 29 traffic.

A capacity analysis of the future traffic patterns should determine which alternative would operate more efficiently due to imbalanced traffic volumes at the intersection.

Alternative A is shown in Figure 10 Appendix A and Alternative B is shown in Figure 9.

3. Route 29 / Cross Creek

The Route 29 / Cross Creek intersection is proposed to be constructed in the future. Due to potential congestion that would be created by signalizing the intersection, the construction of a two-lane roundabout with three approach legs and an inscribed diameter of 180 feet is proposed for construction at the intersection of Route 29 / Cross Creek. The proposed roundabout is shown in Figure 6 Appendix A.

The construction of a roundabout would work in tandem with the proposed roundabout at Riley Road and the proposed intersection improvements at the intersection of Route 29/ Broad Run Church.

4. Route 29 / Broad Run Church

The intersection of Route 29 / Broad Run Church is currently signalized with multiple signal phasing. During field reviews, queues during the PM peak stretched to the Route 29 / Riley Road intersection. Typically delays exceeded 300 to 400 seconds during the peak periods of traffic. Capacity at the intersection is limited especially in the southbound direction on Route 29 due to insufficient green time being provided. Also a rise in the vertical grade in the southbound approach has reduced the capacity and created a bottleneck in the corridor.

Two proposed alternatives are shown in Appendix A. Alternative A is a proposal to construct a four-legged two lane roundabout with an inscribed diameter of 180 feet. The proposed roundabout is shown in Figure 2 Appendix A. The roundabout would significantly increase the capacity of both the southbound and northbound capacity of Route 29. However, due to the vertical grade and imbalanced traffic volumes on Broad Run Church, an Alternative B has been proposed.

One potential solution for the imbalance flows at a roundabout would be to include channelized right turns for the minor street movement and have the minor street (Broad Run Church) left turn movements make a u-turn at a median crossover south of the roundabout and a u-turn at the proposed Route 29 / Cross Creek roundabout. The major advantage of a roundabout at Route 29 /

Broad Run Church would be the complete elimination of the major queues on Route 29 and the increased capacity at the intersection.

Alternative B would be the construction of an indirect left at the Route 29 / Broad Run Church intersection rather than a roundabout. The construction of an indirect left would provide a free movement for southbound traffic on Route 29 and would eliminate the PM queues at the intersection. Alternative B would require a signal at the intersection for the northbound that permits southbound left turns on to Broad Run Church. However, the amount of available green time for the northbound Route 29 traffic would increase along with the northbound capacity. With an indirect left intersection, the left turns from the minor street (Broad Run Church) would still be required to turn right and then make a u-turn at a median crossover south of the intersection or at the proposed roundabout at Route 29 / Cross Creek.

A plan view of Alternative B is shown in Figure 1 Appendix A.

Issues Concerning Roundabout Designs

1. Will the construction of roundabouts interfere or delay emergency vehicles such as fire equipment?

Response: The roundabouts are designed with an inscribed diameter of 180 feet which is sufficient to allow easy access for large vehicles including tractor trailers and fire equipment. The design if necessary will include mountable truck aprons that will permit the largest vehicles to negotiate the roundabout. State DOT's such as New York and Maryland have experienced no access problems with emergency vehicles where the inscribed diameters of the roundabout are 150 feet or greater. Also, the FHWA Roundabout Design Guide indicates that trucks and emergency vehicles do not have any problems traversing 2-lane roundabouts.

As part of the design process, Autoturn (a software program that simulates and tests the ability for vehicles to negotiate highway radii) should be used to confirm the ability of trucks and emergency vehicles to use the roundabouts. If necessary, the roundabout could be laid out with traffic cones on a large parking lot and the emergency equipment tested to assure that the roundabout will be adequate for the vehicles.

2. Are two-lane roundabouts capable of handling the existing and future traffic volumes on Route 29?

Response: Typically, four-legged two-lane roundabouts have an entering capacity of 3,500 to 4,000 vehicles/per hour. Roundabouts with three lane approaches and auxiliary right lanes have experienced capacities up to 6,000 entering vehicles per hour. Based on a preliminary capacity analysis using SIDRA (state of the practice traffic operations software for analyzing roundabouts) of the proposed roundabout design, the corridor operations and queues during the peak periods as well as in the off-peaks would be improved and the delay reduced for existing conditions. The overall capacity of the corridor would be improved as well. Depending upon the traffic patterns, a roundabout provides up to 20% more capacity than an equivalent signalized intersection.

Future traffic forecasts for Route 29 show a significant increase in growth. The current traffic of approximately 45,000 ADT (average daily traffic) may increase to 70,000+ in the next 25 years. However, the traffic forecasts should be reevaluated due to the current slower economic growth that has been experienced. If the traffic does grow at the rate originally forecasted, the proposed improvements may provide adequate levels of service for the north/south through movements on Route 29 with additional improvements. Potential improvements that may be necessary in the future may include expansion of the roundabouts to three lanes with the overall corridor remaining as a 4-lane divided highway between the roundabouts. In the future, the unbalanced flows from the minor movements may require free right movements that merge with Route 29 with designated u-turns at specified medians.

3. Will roundabouts require additional right-of-way and substantial funds to build?

Response: The preliminary layout of the roundabouts indicate only minor additional right-of-way will be necessary and no buildings will need to be taken. Typically the construction cost of roundabouts would be a fraction of the costs that would be required for the construction of grade separated intersections and an expansion of the corridor to a six lane section. An exact estimate of the construction would be possible with further preliminary design work.

4. Are roundabouts safe?

Response: FHWA's Roundabout Guide as well as safety studies conducted in the United States indicate that roundabouts are significantly safer than signalized intersections and have demonstrated lower fatality and injury rates.

5. Will the corridor speeds be impacted?

Response: Typically speeds for vehicles going through a two-lane roundabout travel at a speed of 25 miles per hour. However, the overall corridor travel time would be reduced and the average corridor speeds especially during the peak periods would increase due to the reduced delay at the intersections.

Additional Potential Corridor Improvements

A. Quadrant Roadway Intersection

A quadrant roadway intersection (QRI) works by rerouting all four left-turn movements at a four-legged intersection (in this case Route 29 / Broad Run Church) on to a road or roads (in this case Broad Run Church and the proposed Cross Creek Road) that connects the two intersecting roads. This design prohibits all left turns at the main intersection (Route 29 / Broad Run Church) and therefore allows a simple two phase signal to process the remaining through and right turn movements.

The operational performance has been analyzed using the traffic simulation software VISSIM to compare the operation performance of QR intersections to the conventional intersection. The VISSIM software estimates that the throughput (capacity) would increase by 5 to 15 percent and reduce travel time by 5 to 20 percent reduction compared to the existing intersection.

The construction of the Cross Creek Road would form a QRI and provide additional Route 29 capacity (5 to 15%) for a minimal cost of construction. The construction of the Cross Creek Road combined with a QRI signal layout would have the benefit of being implementable within the existing footprint of Route 29 and using the local roadway system for providing access to future commercial properties. It would serve as temporary congestion relief and is fully described in FHWA's Publication HRT-09-058.

B. Restricted Crossing U-Turn Intersection (RCUT)

The RCUT is also referred to as the J-turn intersection or directional left turns and is characterized by the prohibition of left-turn and through movements from side street approaches. Instead the RCUT intersection permits these movements by requiring drivers on the side streets to turn right onto the main road and then making a U-turn maneuver at a one-way median opening 400 to 1000 feet from the intersection. Maryland has installed RCUT's on US Route 301 and US Route 15 and Michigan has installed them US Route 23/74, Route 1, and US Route 17.

Geometric design features include desirable minimum median widths between 40 and 60 feet to accommodate large trucks. Intersections with narrower medians may be accommodated with bulb-outs (loons) or by widening the medians at the appropriate locations.

Restricted crossing u-turns are very appropriate where the minor flow is less than 20% of the total flow as is the case in the Route 29 corridor. Runs made on the traffic simulation software VISSIM indicate the potential for up to a 30 percent increase in throughput and up to a 40 percent reduction in intersection travel time.

Applications in North Carolina have shown a 17-percent reduction in total crashes and a 41 percent decrease in fatal/injury crashes.

More detailed information is available in FHWA's Publication HRT-09-059.

C. Median U-Turn Intersection (MUT)

MUT intersections can be implemented as either full MUT's where direct left turns from both the major and minor approaches are eliminated – or as a partial MUT where direct left turns are eliminated from only the major approaches. In the Route 29 Corridor the partial MUT would be the most appropriate application. On Route 29 left turns would be eliminated by requiring drivers to travel straight through the at-grade intersection and then execute their left turns by making u-turns at the median opening downstream of the intersection. They then must turn right when they reach the cross street.
Median geometric requirements and width requirements are similar to the requirements of an RCUT. Sufficient storage areas (at least 250 feet) should be provided at the turn bays leading into the u-turn crossovers.

For a MUT intersection the signal design have only two signal phases because direct left-turning traffic at the main intersection is redirected to a U-turn. This results in a 20 to 50 percent increase in throughput according toVISSIM simulation runs. A crash reduction of 20 to 50 percent may be expected according to studies done by the University of Michigan.

MUT intersections are most applicable where the minor road total volume to the total intersection volume ratio is typically less than or equal to 0.25 and the corridor has the potential of high growth.

More detailed information is available in FHWA Publication HRT-09-057.

Recommendations and Comments

1. The traffic forecasts for the Route 29 Corridor should be reevaluated. Past traffic forecasting studies may not have considered the recent downturn in the economy and the recent reduction in traffic. A drop in future traffic forecasts from an 85,000 ADT to a more modest 50% growth forecast of 65,000 ADT would have a significant impact on the projected levels of service and the proposed corridor improvements.

2. For the Route 29 Corridor between Warrenton to the Prince William County Line, a combination of roundabouts, access management techniques (as specified in VDOT's access management regulations) , median u-turn intersections, median closings, quadrant intersections, and restricted u-turn intersections should be considered as a viable alternative to the expansion of the corridor to six lanes and grade separated intersections.

   The initial analysis indicates that the roundabout and innovative intersection improvements as described in this report and the Appendix would improve the capacity and safety within the corridor for existing traffic conditions. The proposed improvements would also provide improved levels of service for future traffic conditions.

   The proposed corridor improvements should be refined to improve the preliminary recommendations for the corridor. Traffic operational software such as S)YNCHRO, VISSIM, HCS, and SIDRA should be applied to the proposed intersection and access management

improvements and additional alternative combinations using innovative intersection design analyzed. The preliminary analysis indicates that there are potential alternatives that would provide an acceptable level of service and not require a six lane Route 29 Corridor with grade separation.

3. For the section of Route 29 between Broad Run Church Road and the Prince William County line the speed limit should be a consistent 45 miles per hour. The lower speed limit will reduce the stopping sight distance requirements, improve safety, make the corridor more amenable to the business community, improve the aesthetics, and be consistent with the necessary approach speeds for proposed improvements such as roundabouts. By lowering the delay at intersections in the corridor, the overall travel time in the corridor will improve even with a 45 mph speed limit.

4. Typically construction costs of access management improvements, roundabouts, indirect left turn medians, and innovative at-grade intersections are significantly lower than grade separated interchanges and widening the corridor to six lanes. Depending on the actual designs the proposed improvements may only cost 10 to 20% of grade separated interchanges and require significantly less right-of-way. After further refinement of the proposed corridor improvements an initial cost comparison between the alternatives should be made.

Appendix A

List of Figures

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
	OVERHEAD UTILITIES	
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
	GAS LINE	
	WATER LINE / VALVE	
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
	SANITARY SEWER MH/LINE	
	TO BE REMOVED	TBR
	WATER EDGE	

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Figure 1 Alternate A Rt 29 and Broad Run Restricted Crossing U-Turn

N

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SCALE IN FEET

PROJECT:
IMPROVEMENTS TO RT. 29
NEW BALTIMORE
FAUQUIER COUNTY, VIRGINIA

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SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 24 OF 25

May 26, 2010 – 12:31pm

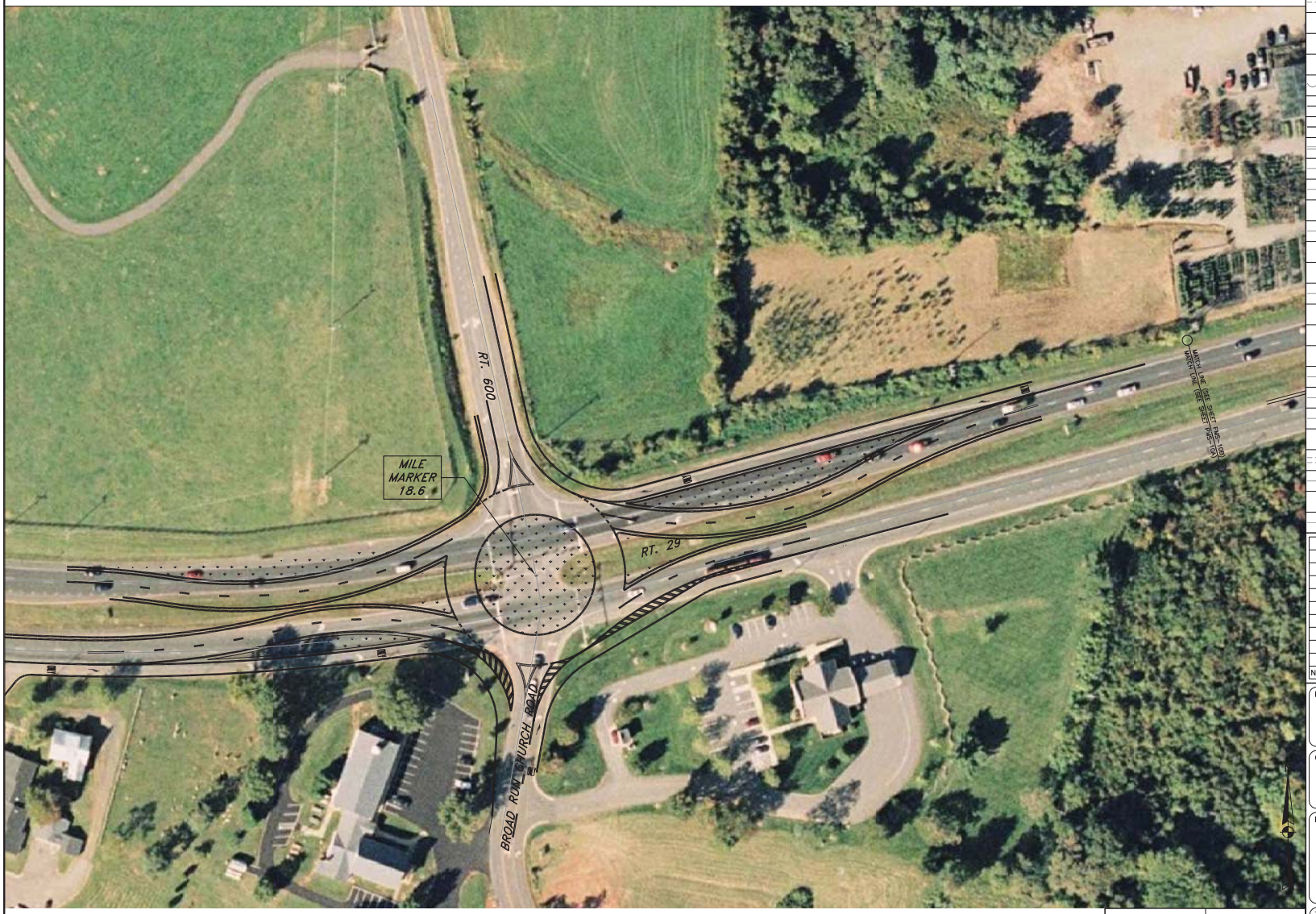

Figure 2 Alternate B Rt 29 and Broad Run Roundabout

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	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHU	OVERHEAD UTILITIES	OHU
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

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SCALE IN FEET

May 26, 2010 – 12:24pm

Figure 3 Alternate A South of Cross Creek
North South Directional Left

EXISTING	TYPE	PROPOSED
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401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHLP OHLP	OVERHEAD UTILITIES	OHLP OHLP
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
X X	FENCE	X X
GASL	GAS LINE	GASL
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SANL	SANITARY SEWER MH/LINE	SANL
	TO BE REMOVED	TBR
	WATER EDGE	

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SCALE IN FEET

May 26, 2010 – 12:31pm

Figure 4 Alternate B Rt 29 South of Cross Creek
North Directional Left

EXISTING	TYPE	PROPOSED
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TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHLP OHLP	OVERHEAD UTILITIES	OHLP OHLP
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
X X	FENCE	X X
GASL	GAS LINE	GASL
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
STMH STML	STORM SEWER MH/INLET/LINE	STMH STML
SANL	SANITARY SEWER MH/LINE	SANL
	TO BE REMOVED	TBR
	WATER EDGE	

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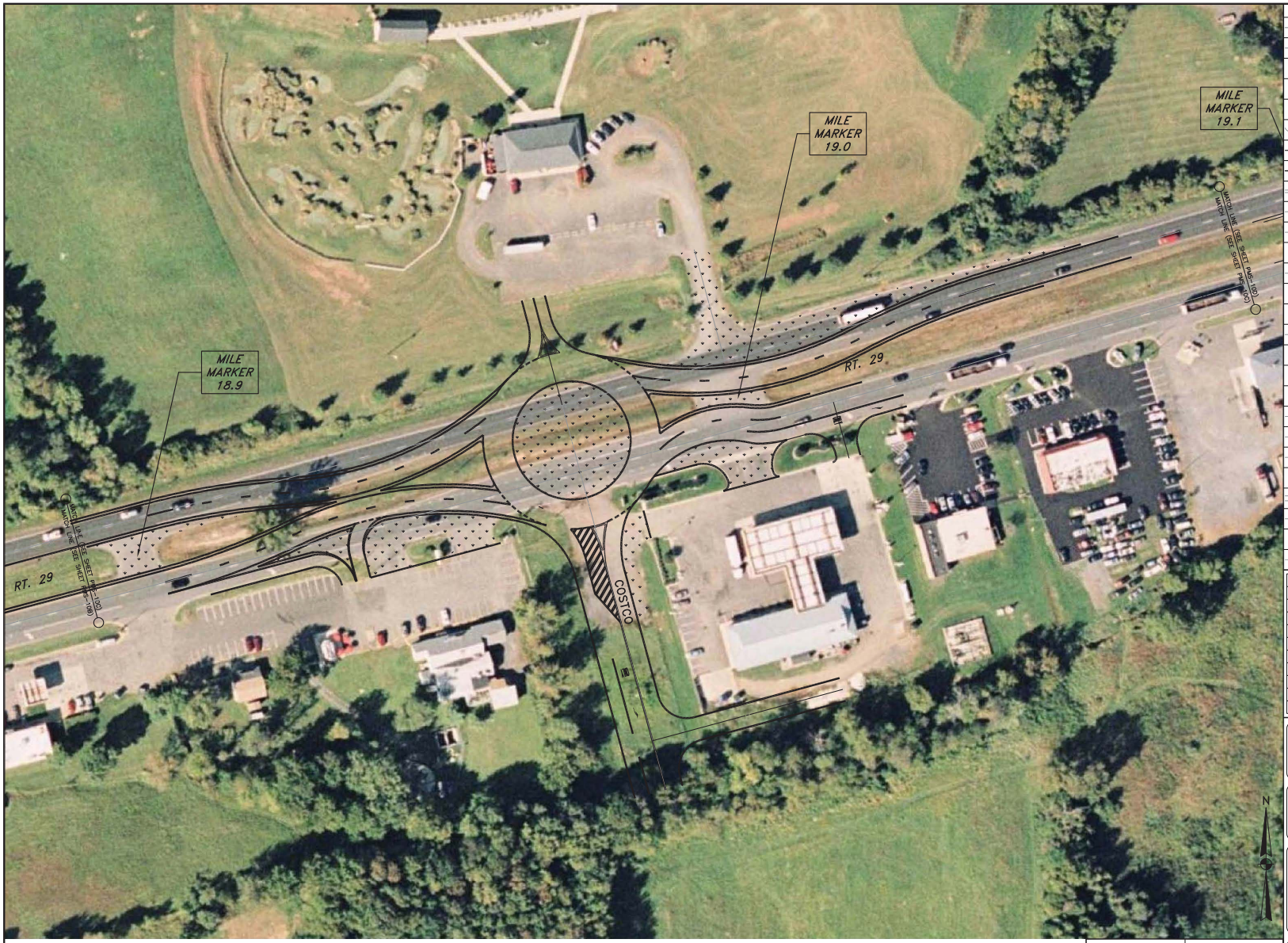
Figure 5 Alternate C Rt 29 South of Cross Creek
Crossover Closed



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DESIGN: S.M. HARNEY	PLAN DATE: 03/24/10	DWG. NO.: PMS-10C
DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 17 OF 25

50 0 50 100
SCALE IN FEET

Figure 6 Rt 29 and Cross Creek Roundabout

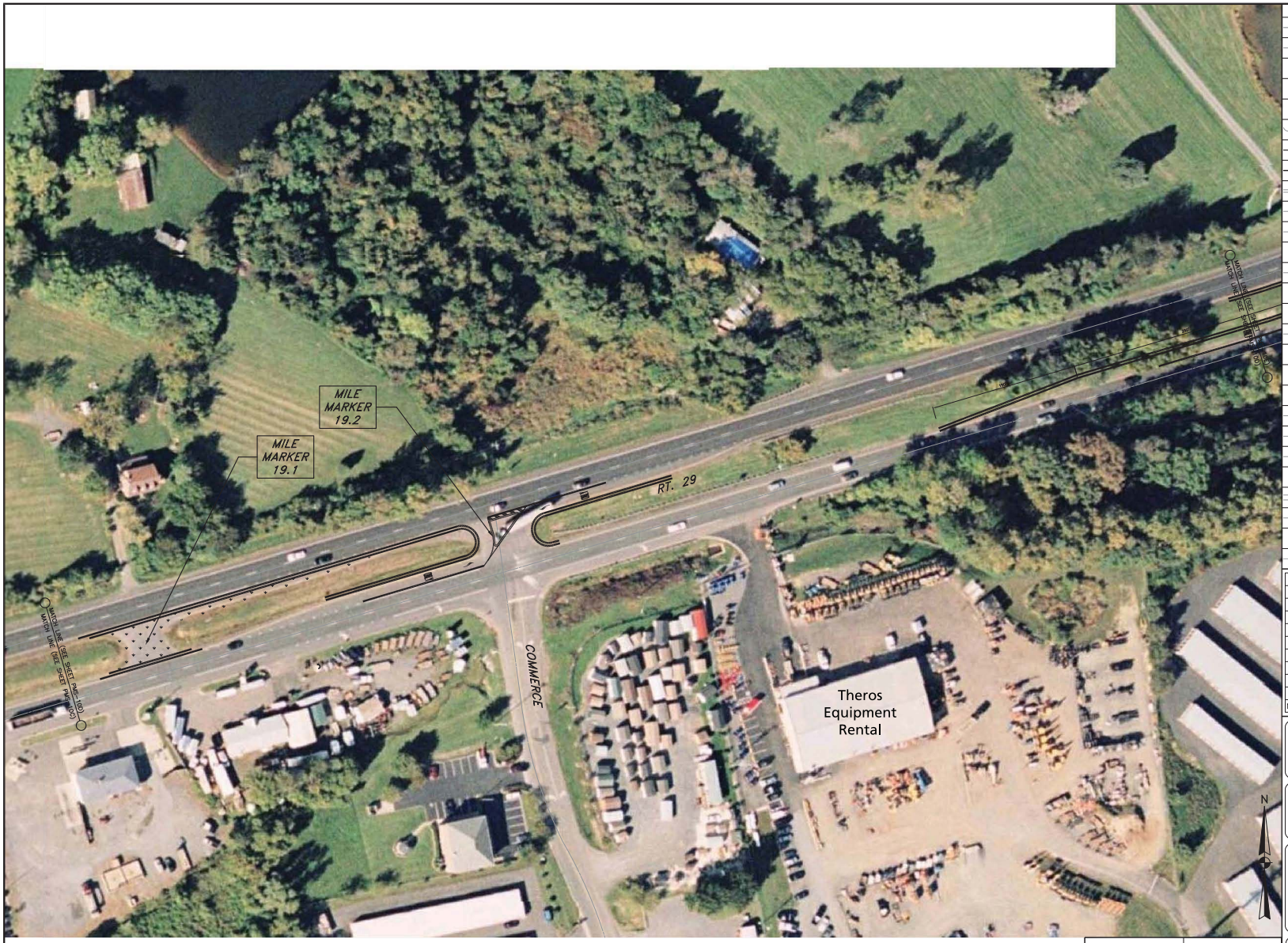

Figure 7 Rt 29 North of Cross Creek

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHLL	OVERHEAD UTILITIES	OHLL
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

PROJECT:
IMPROVEMENTS TO RT. 29
NEW BALTIMORE
FAUQUIER COUNTY, VIRGINIA

CLIENT:
DANE ISMART
5409 RUSTIC PINE COURT
ORLANDO, FL 32819

PREPARER:
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TITLE:
HIGHWAY OCCUPANCY PERMIT
PAVEMENT MARKING & SIGNING PLAN

DESIGN: S.M. HARNEY	PLAN DATE: 03/24/10	DWG. NO.: PMS-10D
DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 18 OF 25

50 0 50 100
SCALE IN FEET

May 26, 2010 – 12:27pm

Figure 8 Rt 29 South of Riley Road Roundabout

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHUE	OVERHEAD UTILITIES	OHUE
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

50 0 50 100
SCALE IN FEET

PROJECT:
IMPROVEMENTS TO RT. 29
NEW BALTIMORE
FAUQUIER COUNTY, VIRGINIA

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PAVEMENT MARKING & SIGNING PLAN

DESIGN: S.M. HARNEY	PLAN DATE: 03/24/10	DWG. NO.: PMS-10E
DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 19 OF 25

May 26, 2010 – 12:28pm

Figure 9 Alternate A Rt 29 and Riley Road Roundabout Full Entrance

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
	OVERHEAD UTILITIES	
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
	GAS LINE	
	WATER LINE / VALVE	
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
	SANITARY SEWER MH/LINE	
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

PROJECT:
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NEW BALTIMORE
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TITLE:
HIGHWAY OCCUPANCY PERMIT
PAVEMENT MARKING & SIGNING PLAN

DESIGN: S.M. HARNEY	PLAN DATE: 03/24/10	DWG. NO.: PMS-5
DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 5 OF 25

50 0 50 100
SCALE IN FEET

May 26, 2010 – 12:24pm

Figure 10 Alternate B Rt 29 and Riley Road Roundabout

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHUE	OVERHEAD UTILITIES	OHUE
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
X	FENCE	X
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
STM	STORM SEWER MH/INLET/LINE	STM
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

PROJECT:
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DESIGN: S.M. HARNEY	PLAN DATE: 03/24/10	DWG. NO.: PMS-10F
DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 20 OF 25

Apr 26, 2010 - 2:17pm

Figure 11 Rt 29 Mile Marker 20.2 to 20.5

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHU	OVERHEAD UTILITIES	OHU
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

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DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 21 OF 25

50 0 50 100
SCALE IN FEET

May 26, 2010 – 12:29pm

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHW	OVERHEAD UTILITIES	OHW
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

PROJECT:
IMPROVEMENTS TO RT. 29
NEW BALTIMORE
FAUQUIER COUNTY, VIRGINIA

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DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 22 OF 25

50 0 50 100
SCALE IN FEET

May 26, 2010 – 12:30pm

Figure 12 Rt 29 and Vint Hill Directional Left

NO.	DESCRIPTION	DATE	RVSD BY	REV BY	APPROVED	DATE
1.	VDOT MARCH 10, 2010 COMMENTS.	3/2010	AHN	JLM		

PROFESSIONAL SEAL:

PROJECT:

RTE 29 ACCESS MANAGEMENT
FAQUIER COUNTY, VIRGINIA

TITLE:

MODIFICATION PLAN FOR
INTERSECTION OF
VINT HILL ROAD (ROUTE 215) AND
LEE HIGHWAY (ROUTE 29)

MCV
4605-C Pinecrest Office Park Dr.
Alexandria, VA 22312-1442
T 703.914.4850
F 703.914.4865
Planning. Engineering. Information Technology

SURVEY	DATE SEPTEMBER 2010
DESIGN BKM	DRAWN BKM
CHKD.	SCALE 1" = 25'
SHEET 1 OF 1	FILE NO.

...\Vint Hill Modifications2.dgn 9/27/2010 10:55:17 AM

Figure 13 Rt 29 North of Vint Hill

EXISTING	TYPE	PROPOSED
400	CONTOUR MAJOR	400
401	CONTOUR MINOR	401
400.05	SPOT ELEVATION	400.05
TEXT	DECIDUOUS TREE	TEXT
TEXT	EVERGREEN TREE	TEXT
	BRUSH / WOODED AREA	
	PROPERTY LINE	
	LEGAL RIGHT-OF-WAY	
	CURB	
	EDGE OF PAVEMENT	
	GUIDERAIL	
	UTILITY POLE	
OHLP	OVERHEAD UTILITIES	OHLP
	LIGHT POLE / FLOOD LIGHT	
	SIGN	A
	EASEMENT LINE	
	PAVEMENT RECONSTRUCTION	
	SAWCUT	
	PAVEMENT MILL / OVERLAY	
	FENCE	
GAS	GAS LINE	GAS
W	WATER LINE / VALVE	W
	FIRE HYDRANT	
	STORM SEWER MH/INLET/LINE	
SAN	SANITARY SEWER MH/LINE	SAN
	TO BE REMOVED	TBR
	WATER EDGE	

NO	REVISION	BY	DATE

PROJECT:
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DESIGN: S.M. HARNEY	PLAN DATE: 03/24/10	DWG. NO.: PMS-10I
DRAWN: J.D. GILMORE	SCALE: AS NOTED	
SURVEY DATE: –	DWG. FILE: 543001	SHT. NO.: 23 OF 25

50 0 50 100
SCALE IN FEET

May 26, 2010 – 12:30pm