

Patton Harris Rust & Associates
Engineers, Surveyors, Planners, Landscape Architects.

ATTACHMENT 1

May 12, 2009

Via Electronic and US Mail

Mr. George R. Phillips
County of Loudoun
Office of Transportation Services
1 Harrison Street, S.E., 4th Floor
Leesburg, VA 20177-7000

Re: **Loudoun Water Treatment Plant Parcel 15
Traffic Statement Proposed Work Scope
Loudoun County, Virginia
PHR+A F- 10348-2-0**



CORPORATE:
Chantilly

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T 800.550.PHRA
T 703.449.6700
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14532 Lee Road
Chantilly, VA
20151-1679

Dear Mr. Phillips:

As discussed at our Wednesday, April 30, 2009 meeting, Patton Harris Rust & Associates, (PHR+A) proposes the following traffic analyses to support the proposed rezoning and special exception for a portion of Parcel 15 adjacent to Goose Creek and the Dulles Greenway. Loudoun Water proposes to construct a water treatment plant on a portion of the property as part of an effort to implement its Central Water Supply Program. As part of this Program, water will be withdrawn from the Potomac River, conveyed and stored in one or more nearby quarries as necessary, and treated at the proposed water treatment plant. The water treatment plant will have access to Gant Lane (VA Route 652) in the Catoctin District.

The following supplemental materials are suggested to be included in the traffic statement to satisfy the County's F.S.M. Traffic Study Guidelines:

Background Information:

Location: 1 Parcel (portion) north of Dulles Greenway

Parcels: 61-15 (MCPI #153-35-5865)

Acreage: 168.37 ac. (50 acres for subject application)

Existing Zoning: TR-10

Proposed Zoning: MR-HI

General Use: The site access is proposed as a private road to the existing turn-around at the south terminus of Gant Lane. Construction of a water treatment facility on a portion of Parcel 15. The proposed SPEX application by the Applicant (Loudoun Water) will include a facility for a maximum of 20 employees. Water Treatment Plant operations include truck deliveries limited to an average of 2 trips per day for materials/equipment and service. The site access is proposed as a private road access to the existing turn-around at the south terminus of Gant Lane. A companion SPEX by the Applicant will propose use of a retired Luck Stone Quarry for water storage. The storage area will have minimal traffic impacts on

Mr. George Phillips
Loudoun Water Treatment Plan Parcel 15 Traffic Scope
May 12, 2009
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the public street system (Va. Route 659 or Va. Route 653), except for routine maintenance with access as currently provided.

Pre-Application meeting: Tuesday, March 10, 2009.

VDOT Chapter 527 Requirements

None anticipated; Document existing conditions. Future traffic associated with 20 employees not anticipated to satisfy VDOT Chapter 527 volume criteria. The traffic statement will confirm that uses would generate less than 250 vph and 2,500 vpd new trips for a non-residential rezoning.

PHR+A

Traffic Statement Elements

The following elements should be included in the modified traffic statement:

1. **Study Area**: Include existing site access to Va. Route 652 and at the intersection of Rte 652/653.
2. **Traffic Count Locations**: Provide counts for off-site location for AM and PM peak periods on Route 652 at Cochran Mill Road (Va. Route 653). Document heavy vehicle percentages and include in traffic statement appendix. Compare to Stonewall Center Business Park counts at Route 643/Route 653 to the west of Gant Lane.
3. **Trip Generation**: Calculate for General Industrial use (ITE Code 110) based on 20 employees for the water treatment plant. Check trips in relation to building size.
4. **Traffic Volume Projections**: For traffic statement, assume 2015 operations. No forecasts for build-out plus 10 years.
5. **LOS Analysis**: Calculate intersection operations for existing conditions, with growth (background), and with site.
6. **Minimum Roadway/Intersection LOS Standards**: LOS "D" standards.
7. **Background Traffic Assumptions**: Document VDOT historical growth trends and peak hour counts. Grow through trips on Route 653, based on annual trends. No assignments associated with Stonewall Business center to the east, since not approved. Not assuming improvements to Crosstrail Boulevard.
8. **Traffic/Trip Distribution**: Check existing counts for splits, based on travel time to the east. Assume 50 percent west on Route 653 and 50 percent northeast on Route 653. Assign all truck trips via Route 653 north.

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- 9. **LOS Calculations Assumptions:** For isolated unsignalized intersections, capacity using HCS software. Use defaults and existing peak hour factor. Outputs included for existing, background, and total at Route 653/652. Provide CD for HCS analysis.
- 10. **Mode Choice:** Assume no transit service.
- 11. **Safety Locations:** Statement will summarize any road safety hazards as identified by ISTEAs set-aside funding criteria for the study area.
- 12. **Traffic Mitigation Measures:** Document improvements, if needed, for safe access. Describe site access with limited access control (no access) to Dulles Greenway.
- 13. **Bicycle & Pedestrian Accommodations:** Identify existing conditions.

Please advise in the signature block below if the work scope is acceptable. Thank you for your assistance on the proposed project. A copy of the authorized work scope will be included in the traffic statement appendix.

Sincerely,

PATTON HARRIS RUST & ASSOCIATES

Douglas R. Kennedy, P.E.
Vice President, Director of Transportation Planning
P:\PROJECT\10348\2-0\corres\PHRA_Loudounwater15_Traffic statement_scope_051209.doc

Acknowledged and accepted this 12th day of May, 2009.

By: George R. Phillips
George R. Phillips

For: Loudoun OTS
Loudoun County Office of Transportation Services

Cc: Karen Arnold - Loudoun Water
Bob Brown - Urban
Laurie Butakis - PHRA

June 1, 2009

Mr. George R. Phillips, AICP
County of Loudoun
Office of Transportation Services
1 Harrison Street, S.E.
P.O. Box 7000
Leesburg, Virginia 20177-7000



**Re: Loudoun Water Parcel 15 Treatment Facility
Traffic Statement
PHR+A 10348-2-0**

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14532 Lee Road
Chantilly, VA
20151-1679

Dear Mr. Phillips:

The following is a summary of trip generation and traffic operations for the proposed special exception for the construction of a water treatment facility on a portion of parcel 15 on Gant Lane (Va. Route 652) north of the Dulles Greenway in the Catocin District. The site is a 50 acre portion of parcel 61-15 (MCPI #153-35-5865) and is proposed for MR-HI zoning. The existing zoning is TR-10 on the entire 168.37 acres. Loudoun Water proposes to construct a water treatment plant on a portion of the property as part of an effort to implement its Central Water Supply Program. As part of this Program, water will be withdrawn from the Potomac River, conveyed and stored in one or more nearby quarries as necessary, and treated at the proposed water treatment plant.

The site access is proposed as a private road to the existing turn-around at the south terminus of Gant Lane. The proposed SPEX application by the Applicant (Loudoun Water) will include a facility for a maximum of 20 employees. Water Treatment Plant operations include truck deliveries limited to an average of 2 trips per day for materials/equipment and service. A companion SPEX by the Applicant will propose use of a retired Luck Stone Quarry for water storage. The storage area will have minimal traffic impacts on the public street system (Va. Route 659 or Va. Route 653), except for routine maintenance with access as currently provided. Based on the scoping session with Loudoun County OTS staff on Wednesday, April 30, 2009, the County traffic report requirements were adjusted to reflect the unique activities. A copy of the scoping letter for the traffic statement is attached as Appendix A, which includes a description of the scope in relation to the Loudoun County FSM guidelines.

The traffic statement outlines the comparison to the VDOT Chapter 527 requirements (which are not satisfied) and a description of traffic conditions with and without the proposed uses. Overall, the proposed uses can be accommodated with the existing roadway infrastructure.



VDOT Chapter 527 Requirements

As part of the requirements of VDOT's Chapter 527 regulations, a traffic impact analysis must be submitted with any rezoning or special exception action if the site trip generation is over a certain threshold. On behalf of the owner, Loudoun Water, Urban Engineering, Ltd. is submitting the site plan for the public utility uses on a portion of the site. The following paragraphs outline our understanding of the Code of Virginia Section 15.2-2222.1 and the Traffic Impact Analysis Regulations 24 VAC 30-155-40 for rezoning plans in relation to the proposed land use activity. For the subject site, the net trip generation for the site provides support that additional Chapter 527 review is **not** required.

Trip Generation

For trip generation calculations, the proposed uses were derived based on the number of employees and comparison to general employment uses in the Institute of Transportation Engineers (ITE) *Trip Generation (8th Edition)* Manual. Since this is a unique use, the ITE Manual does not have a direct public utilities use. However, in consultation with the applicant and the County, the application of a trip rate based on the maximum employee counts was used to determine possible trips. The application of ITE trip rates for general industrial and manufacturing uses were used consistent with VDOT guidelines. Note that the use is not anticipated to accommodate office uses, meeting areas or visitors associated with other public utility uses – such as the Loudoun Water headquarters in Ashburn – and truck deliveries and distribution are minimal, so the trips are expected to be significantly less than industrial facilities. Note that deliveries are for supplies and equipment only, as the transmission of services (water) is accommodated with the proposed pipeline from the Potomac River and the connections to existing and proposed water storage and distribution systems.

A range of general employment uses were evaluated (ITE Codes 110 through 140) with the uses not to exceed a 0.125 FAR and a the inhabitable building area at approximately 100,000 gsft. Based on the maximum number of employees, the trip generation for the peak hours, the peak hour of the generator, and total daily trips were computed reflecting the SPEX plan uses are summarized in the Table 1. The VDOT range of trip rates for the ITE trip rate variables are included in Table 2 showing the maximum trip generation associated with the proposed plans (inbound and outbound are not shown in Table 1, since they are not relevant to the 527 threshold analysis).

PHR+A suggested a peak hour trip rate for heavy industrial for the AM peak, light industrial (PM peak) and manufacturing (Daily) to reflect the anticipated traffic activities, which relate to the average site trips of the range of employee uses. Note that the equations for manufacturing uses were not accurate since the proposed variable sizes well below the ITE average data base size.



TABLE 1
VDOT CHAPTER 527 TRIP GENERATION

Use	AM Peak	PM Peak	PM Peak Hour of Generator	Daily Trips (VPD)
Water Treatment Plant @ 20 employees	10	8	10	43
Total Rezoning & SPEX Plan	10	8	10	43
VDOT Threshold	NO < 250	NO < 250	NO < 250	NO < 2,500

Source: ITE Trip Generation, 8th Edition, (Computations by PHR+A) See Table 2 for details.

For a traffic impact analysis to be required for commercial uses (other uses), the total peak hour trips must exceed 250 trips per hour. The peak trips over one hour for this site is 10 trips, so the threshold is not reached. The threshold for daily trips is 2,500, which is far greater than the 43 generated by this site. Since the use is not a residential activity, the VDOT low volume road threshold also does not apply. Therefore, a VDOT 527 review is not required with the rezoning plan submission.

Roadway Context

The site study area has 2 public streets, with no programmed construction improvements consistent with the Countywide Transportation Plan and development proffers:

- Gant Lane (Va. Route 653) – Serves the site with an all-weather surface roadway southeast of Route 653. No speed limit posted and the roadway width varies with pavement between 10 and 12 feet in width, with 15 feet adjacent to Va. Route 653. The road crosses Sycolin Creek with a concrete bridge with 11.2 feet clearance and no guard rails. The road also crosses a branch of the Sycolin creek with a culvert, before turning east towards the property. The road also crosses two transmission lines (underground and overhead) before turning south. The road terminates at the Parcel 15 gate with a turnaround area. At the turn around, the road is approximately 10 feet wide without clear area for drainage. The Road serves a single family residence to the west of Gant Lane as well as a commercial paint ball outdoor facility. At the paint ball driveway, the road is widened with a fork area which allows vehicles to pass one another. At Route 653, Gant Lane has a gravel surface with a flared edge of pavement oriented to the north leg of Route 653 and a grass median island with approximately 24-26 feet of width on either side.



- Route 653 and a grass median island with approximately 24-26 feet of width on either side.
- Cochran Mill Road (Va. Route 653) in the vicinity of the site is an all-weather gravel road with a variable width of between 15 and 18 feet of travel clearance, and ditches on the cut side of the road. To the west, Route 653 follows the north side of Sycolin Creek to Route 643. The road is posted at 25 MPH for the all-weather surface. To the north, Route 653 extends as a two lane collector to the W&OD Trail crossing. To the north, the road is paved and widened with curb and gutter to a four lane undivided collector road serving the existing quarries and industrial activities. Cochran Mill Road is posted at 35 MPH and extends to the Town limits and connects to the recently opened Crosstrail Boulevard interchange at VA. Route 7.
 - Dulles Greenway (Va. Route 267) is a six lane divided limited access principal arterial south of Parcel 15 with adjacent t interchanges at Route 653 and Route 659. No site access is provided, although a farm access at the Goose Creek bridge allows access to the both sides of the limited access fence.

The Route 653/Route 652 intersection is angled with the south leg (Gant Lane) as stop control. Sight distance is adequate to the north to the overhead transmission line easement and exceeds a 25 MPH speed looking west. Gant Lane is a narrow road with one sharp bend south of the creek. Both roads are not constructed to VDOT local or collector road standards in terms of shoulder width, pavement surface area, and vertical curves and Route 653 has inadequate horizontal curves as a local street; However, truck traffic was observed on Route 653 north as passing simultaneously at low speeds (20 MPH) and school buses do turn around at Route 653 to travel west on Route 653 to Sycolin Road. No other traffic hazards were observed.

Route 653 is programmed in the CTP as a four lane undivided collector road, with a new alignment at Route 652 extending southwest across the floodplain to Route 643 adjacent to Route 648. No funds are programmed. The planned Crosstrail Boulevard corridor west of Route 653 is aligned to connect Route 7 with the Shreve Mill Road interchange at the Dulles Greenway. Some R-O-W reservation has been provided for as part of County approvals for Phil Bolen Park, but no construction initiated south of the Town. Route 652 is a local road.

Special Exception Traffic Conditions

The following sections highlight the localized traffic forecasts with and without the proposed special exception.

Existing Conditions

Traffic counts by PHR+A in May 2009 were used to establish existing traffic conditions. Data was collected on Tuesday, May 5, 2009 and Tuesday, May 12, 2009 during the

roadway peak periods. The summary of the counts are shown in Table 3 with the LOS operations shown in Table 4. The count worksheets are included in Appendix B and the Highway Capacity Manual (HCS) outputs for the Route 653/Route 652 unsignalized intersection are included as Appendix C.

TABLE 3: EXISTING 2009 PEAK HOUR AND DAILY TRAFFIC VOLUMES

Direction	Peak Hour Volume		Daily Traffic Volume*
	AM	PM	
Route 653 Northbound			700
NB Through	6	22	
NB Right	2	1	
Route 653 Southbound			730
SB Through	17	47	
SB Left	2	1	
Route 652 WB/NB			50
NB Left	3	3	
NB Right	2	0	

* Daily traffic volume (combined northbound and southbound) obtained using a 'k-factor' of 0.10

TABLE 4: LEVELS OF SERVICE SUMMARY – EXISTING TRAFFIC CONDITIONS

Intersection		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Route 653 @ Gant Lane	NB				
	SB	A	7.4	A	7.5
	NB 652	A	8.7	A	9.7
	Overall				

LOS = Levels of Service; Delay = Delay in seconds. LOS not shown overall for unsignalized intersections or for approaches without left turns.

Growth Trends

The VDOT Historical traffic volumes are summarized in Table 5a, with comparisons to the most current turning movement data on a adjacent section on Route 653 shown in Table 5B. 2008 and 2009 data for Loudoun County Parkway have not been published by VDOT.

The VDOT counts shows effective growth rates between 7 and 60 percent on Route 653 and no growth on Gant Lane in the last 6 years. Based on the slight growth in the last year during the peak periods on Cochran Mill Road, with increases in through trips, PHR+A increased traffic on Route 653 at 13 percent per year and conservatively increased turns at 5 percent per year between 2009 and the design year of 2015. The increase in traffic are shown to verify if additional growth would require infrastructure improvements prior to site development.



Background Traffic Conditions

The summary of the future intersection traffic volumes with growth and without the subject SPEX are shown in Table 6 with the LOS operations shown in Table 7. A design year of 2015 was assumed for the completion of the facility. A design year plus 10 was not required for this study. The count worksheets are included in Appendix B and the Highway Capacity Manual (HCS) outputs for the Route 653/Route 652 unsignalized intersection are included as Appendix D.



TABLE 6: BACKGROUND 2015 PEAK HOUR AND DAILY TRAFFIC VOLUMES

Direction	Peak Hour Volume		Daily Traffic Volume*
	AM	PM	
Route 653 Northbound			1670
NB Through	14	51	
NB Right	3	2	
Route 653 Southbound			1620
SB Through	40	109	
SB Left	3	2	
Route 652 WB/NB			90
NB Left	5	5	
NB Right	3	0	

* Daily traffic volume (combined northbound and southbound) obtained using a 'k-factor' of 0.10

TABLE 7: LEVELS OF SERVICE SUMMARY – BACKGROUND TRAFFIC CONDITIONS

Intersection		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Route 653 @ Gant Lane	NB				
	SB	A	7.5	A	7.8
	NB 652	A	9.2	B	11.9
	Overall				

LOS = Levels of Service; Delay = Delay in seconds. LOS not shown overall for unsignalized intersections or for approaches without left turns.

Future Traffic Conditions

The future traffic volumes account for growth, other development, and approved land uses adjacent to the subject site.

Site Trip Generation

As outlined in the Chapter 527 section, PHR+A utilized the trip generation rates listed in the 8th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* to estimate the number of trips generated by the proposed water treatment uses. For the subject site, employment uses (ITE land use code 110, 120 and 140) were used based on 20 employees, as summarized in Table 8. Trip generation based on building size was not considered appropriate for the proposed use.



TABLE 8
 LOUDOUN WATER – TRIP GENERATION SUMMARY

	AM Peak Period			PM Peak Period			Daily
	In	Out	Total	In	Out	Total	
Treatment Plant* (20 employees)	8	2	10	2	6	8	43

Note: * Total trips do not include the pass-by and internal trip reductions

Since the special exception is a portion of the entire site, the remainder of the property may be used as a future quarry use with a pending SPEX and rezoning. Those traffic impacts are addressed with a separate application, but the truck activities associated with future quarry excavation and stone deliveries are not anticipated to be via Gant Lane.

In comparison. The existing zoning on 50 acres would allow 50 Daily trips fore five single family houses.

Total Build-Out Traffic Volumes

The total build-out traffic volumes were derived by factoring the following traffic volume changes:

- Ambient traffic growth (as outlined in the Background conditions)
- Trips generated by the proposed uses.

The subject site SPEX at 20 employees were assigned with 50 percent to the north. All truck traffic would be directed to the north, as shown in Table 9.

TABLE 9
 SITE TRIP DISTRIBUTIONS

Link	Distribution
Route 653 to 643 (west)	50 %
Route 653 to Rte 7 (north)	50 %
Total	100%

Traffic Operations



The total build-out peak period traffic volumes at the subject intersection is presented in Table 10. The subject intersection was evaluated using the Highway Capacity Software (HCS +) version 5.2. The unsignalized intersection operates at LOS "B" or better during the peaks with the subject site traffic, with LOS similar to the background conditions.

The analysis results indicate that the study area intersection operates acceptably with LOS 'B' or better during both a.m. and p.m. peak periods. The intersection analysis results are summarized in Table 11 along with the approach LOS and delay. The HCS analysis outputs are included as Attachment E.

TABLE 10: TOTAL 2015 PEAK HOUR AND DAILY TRAFFIC VOLUMES

Direction	Peak Hour Volume		Daily Traffic Volume*
	AM	PM	
Route 653 Northbound			1700
NB Through	14	51	
NB Right	7	3	
Route 653 Southbound			1640
SB Through	40	109	
SB Left	7	3	
Route 652 WB/NB			130
NB Left	6	8	
NB Right	4	3	

* Daily traffic volume (combined northbound and southbound) obtained using a 'k-factor' of 0.10

TABLE 11: LEVELS OF SERVICE SUMMARY – TOTAL TRAFFIC CONDITIONS

Intersection		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Route 653 @ Gant Lane	NB				
	SB	A	7.5	A	7.5
	NB 652	A	9.2	B	11.1
	Overall				

LOS = Levels of Service; Delay = Delay in seconds. LOS not shown overall for unsignalized intersections or for approaches without left turns.

Site Impacts

Overall the proposed uses increase trips by 13 percent in the AM peak and by 5 percent in the PM peak, based on the change in traffic over the total 2015 conditions. Site trips on Route 652 south of Cochran Mill Road is approximately 40 percent of the future volumes.

Conclusions

Based on the trip generation and intersection analysis, PHR+A offers the following conclusions:

1. The trips generated by the proposed land use densities can be accommodated within the existing infrastructure.
2. The intersection of Route 653 and Gant Lane operates with acceptable LOS as a two-way stop controlled intersection,
3. The changes in land use type and incremental trips generated by the special exception densities have minimal impact on the study area roadway network,
4. Site Daily trip generation is comparable to existing zoning as TR-10 residential.
5. Use as a treatment plant will add peak hour trips to the roadway, but the directional trips are minor and can be accommodated with the existing all-weather road, with total daily trips of less than 150 vpd.
6. Use of the facility and the adjacent reservoir holding areas and water intakes do not account for significant turning trips to justify separate turn lanes.
7. No additional mitigation suggested, roadway conditions are adequate for safe access for the proposed use.
8. A VDOT 527 study is not required for the proposed use.

We hope the above analysis will satisfy the OTS requirements in approving the special exception uses. Please contact our office at (703) 449-6700 if you have any further questions.

Sincerely,
PATTON HARRIS RUST & ASSOCIATES



Douglas R. Kennedy, P.E.

Vice President

Director of Transportation Planning

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PHR+A

Mr. George R. Phillips
Loudoun Water Parcel 15 Traffic Statement
June 1, 2009
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Enclosures:

Table 2: Site Trip Generation
Table 5A: Historical Daily Traffic Volumes
Table 5B: VA Route 653 Traffic Comparisons

Appendix A: Scoping Notes
Appendix B: Gant Lane Traffic Counts
Appendix C - E: HCS Outputs

PHR+Λ

cc: Karen Arnold
Bob Brown

Table 2
Site Trip Generation

<i>ITE Land Use (1)</i>				<i>AM PEAK HOUR</i>			<i>PM PEAK HOUR</i>			<i>DAILY</i>	
<i>CODE</i>	<i>CODE</i>	<i>DENSITY</i>	<i>Var.</i>	<i>USE</i>	<i>IN</i>	<i>OUT</i>	<i>TOTAL</i>	<i>IN</i>	<i>OUT</i>	<i>TOTAL</i>	<i>(2-way)</i>
Proposed SPEX Uses											
Maximum Building Area		Water Treatment Plant		50	Acres	@	0.125	FAR =	272.250 ksf		
		Estimated Inhabitable Areas		50	Acres	@	0.050	FAR =	108.900 ksf		
110	110.100	20.000	emp	General Light Industrial	7	2	9	2	6	8	60
120	120.100	20.000	emp	Heavy Industrial	8	2	10	4	14	18	16
140	140.100	20.000	emp	Manufacturing	6	2	8	3	4	7	43
140	140.180	20.000	emp e	Manufacturing @ 20 emp	10	4	14	0	0	0	281
				Site Trips, Max	10	4	14	4	14	18	60
				Site Trips Average (3)	10			11			52
				Best Fit Site Trips Associated with Use	8	2	10	2	6	8	43
110	110.150	20.000	emp	Gen. Light Ind. (Gen)	Site Trips, Peak Hour Generator			3	7	10	

Alternative Trips based on SF, Not Used

110	110.200	108.900	ksf	General Light Industrial	88	12	100	13	93	106	759
110	110.400	108.900	ksf e	Gen. Light Ind. @ 108,900 gsf	34	5	39	0	-2	-2	712
120	120.200	108.900	ksf	Heavy Industrial	50	6	56	9	65	74	163
140	140.200	108.900	ksf	Manufacturing	62	17	79	28	51	79	416
140	140.400	108.900	ksf e	Manuf. @ 108,900 gsf	48	13	61	25	44	69	402

VDOT 527 Check Rezoning Plan

Peak Hour Of Use, No Adjustments

Peak hr of Street, no adj	8	43
Peak hr of Generator	10	
Saturday Generator	0	
Ex. Uses, no counts	0	0
Net Trips	10	43

Non-Residential Threshold for Rezoning/Site Plan 250 2,500
527 Required? NO NO

<i>ITE Land Use (1)</i>	<i>Effective Trip Rates (2)</i>		<i>AM Peak Hour</i>		<i>PM Peak Hour</i>		<i>Daily</i>
<i>CODE</i>			<i>(2-way)</i>	<i>%</i>	<i>(2-way)</i>	<i>%</i>	<i>(2-way)</i>
110	General Light Industrial	emp	0.45	78%	0.40	25%	3.00
120	Heavy Industrial	emp	0.50	80%	0.90	22%	0.80
140	Manufacturing	emp	0.40	75%	0.35	43%	2.15
140	Manufacturing @ 20 emp	emp	0.70	71%	0.00		14.05
110	Gen. Light Ind. (Gen)	emp			0.50	30%	
110	General Light Industrial	ksf	0.92	88%	0.97	12%	6.97
110	Gen. Light Ind. @ 108,900 gsf	ksf	0.36	87%	-0.02	0%	6.54
120	Heavy Industrial	ksf	0.51	89%	0.68	12%	1.50
140	Manufacturing	ksf	0.73	78%	0.73	35%	3.82
140	Manuf. @ 108,900 gsf	ksf	0.56	79%	0.63	36%	3.69

TRIP RATE SOURCE:

Trip Generation Manual (8th Edition), Institute of Transportation Engineers; 2008.

Average trip rates used, unless noted with "e" then equations used.

(1) ITE Land Code shown as the first 3 digits. Decimal shown for internal use by PHR+A for lookup table for trip rate variable.

(2) Effective trip rates calculated by land use:

For average rates = Density * ave. trip rate = 2-way Trips ; * inbound percentage for Trips In

For ITE equations = Density * trip equation = 2-way Trips ; * inbound percentage for Trips In

(3) Average Trip rates excluded PM for Manufacturing equations (< 0) and Daily Manufacturing eq. (no S.D.)

For Parcel 15, trips for assignments based on uses most approximating the averages, reflecting expected trips for treatment plant

**Table 5A
Historical Daily Traffic Volumes**

**Daily Traffic Growth Trends
VA Route 653 Cochran Mill Rd
between Rte 643 Sycolin Rd and Rte 652 Gant Lane, Loudoun County**

YEAR	AADT	Effective Annual Growth Rate	Effective Growth Rate (6YR)	Effective Growth Rate (5YR)	Effective Growth Rate (4YR)
2007	270	8.0%	7.0%	19.7%	22.5%
2006	250	4.2%		6.8%	22.8%
2005	240	84.6%			7.5%
2004	130	8.3%			
2003	120	9.1%			
2002	110	-38.9%			
2001	180				
Average Growth Rate		12.6%	7.0%	13.2%	17.6%

**Daily Traffic Growth Trends
VA Route 653 Cochran Mill Rd
between 1.7mi north Rte 652 Gant Lane and Rte 863 Durham Ct , Loudoun County**

YEAR	AADT	Effective Annual Growth Rate	Effective Growth Rate (6YR)	Effective Growth Rate (5YR)	Effective Growth Rate (4YR)
2007	1,200	9.1%	60.6%	18.7%	21.0%
2006	1,100	10.0%		73.5%	21.2%
2005	1,000	66.7%			94.4%
2004	600	7.1%			
2003	560	9.8%			
2002	510	628.6%			
2001	70				
Average Growth Rate		121.9%	60.6%	46.1%	45.5%

**Daily Traffic Growth Trends
VA Route 652 Gant Lane
South of Rte 653, Loudoun County**

YEAR	AADT	Effective Annual Growth Rate	Effective Growth Rate (6YR)	Effective Growth Rate (5YR)	Effective Growth Rate (4YR)
2007	30	0.0%	0.0%	0.0%	0.0%
2006	30	0.0%		0.0%	0.0%
2005	30	0.0%			0.0%
2004	30	0.0%			
2003	30	0.0%			
2002	30	0.0%			
2001	30				
Average Growth Rate		0.0%	0.0%	0.0%	0.0%

SOURCE: VDOT, Traffic Engineering Division, VDOT Average Daily Volume Estimates Including Vehicle Classification Estimates, Jurisdiction Report 53.
Average of data points Rte 653 40.6%

**Table 5B
VA Route 653
Traffic Volume Comparison**

**Peak Hour Link Traffic Volume Comparisons
Va. Rte 653 (Cochran Mill Rd) West of Rte 653**

<u>PHR+A 2009 Vs Wells 2008 Traffic Volumes</u>							
<u>Year</u>		<u>AM PEAK Traffic (1)</u>	<u>Average Growth %</u>	<u>Year</u>		<u>PM PEAK Traffic (1)</u>	<u>Average Growth %</u>
2009	(1)	28	40.0%	2009	(1)	73	32.7%
2008	(2)	20		2008	(2)	55	

Notes: (1) PHR+A, May 2009 counts at Rte 653/652
(2) Wells, June 2008 counts at Rte 653/643

Patton Harris Rust & Associates
Engineers, Surveyors, Planners, Landscape Architects.

May 12, 2009

Via Electronic and US Mail

Mr. George R. Phillips
County of Loudoun
Office of Transportation Services
1 Harrison Street, S.E., 4th Floor
Leesburg, VA 20177-7000

Re: Loudoun Water Treatment Plant Parcel 15
Traffic Statement Proposed Work Scope
Loudoun County, Virginia
PHR+A F- 10348-2-0



CORPORATE:
Chantilly

VIRGINIA OFFICES:
Chantilly
Charlottesville
Fredericksburg
Harrisonburg
Leesburg
Newport News
Norfolk
Winchester
Woodbridge

LABORATORS:
Chantilly
Fredericksburg

MARYLAND OFFICES:
Baltimore
Columbia
Frederick
Georgetown
Hollywood
Hunt Valley
Williamsport

PENNSYLVANIA OFFICE:
Allentown

T 800.550.PHRA
T 703.449.6700
F 703.449.6713
14532 Lee Road
Chantilly, VA
20151-1679

Dear Mr. Phillips:

As discussed at our Wednesday, April 30, 2009 meeting, Patton Harris Rust & Associates, (PHR+A) proposes the following traffic analyses to support the proposed rezoning and special exception for a portion of Parcel 15 adjacent to Goose Creek and the Dulles Greenway. Loudoun Water proposes to construct a water treatment plant on a portion of the property as part of an effort to implement its Central Water Supply Program. As part of this Program, water will be withdrawn from the Potomac River, conveyed and stored in one or more nearby quarries as necessary, and treated at the proposed water treatment plant. The water treatment plant will have access to Gant Lane (VA Route 652) in the Catoclin District.

The following supplemental materials are suggested to be included in the traffic statement to satisfy the County's F.S.M. Traffic Study Guidelines:

Background Information:

Location: 1 Parcel (portion) north of Dulles Greenway

Parcels: 61-15 (MCPI #153-35-5865)

Acreage: 168.37 ac. (50 acres for subject application)

Existing Zoning: TR-10

Proposed Zoning: MR-HI

General Use: The site access is proposed as a private road to the existing turn-around at the south terminus of Gant Lane. Construction of a water treatment facility on a portion of Parcel 15. The proposed SPEX application by the Applicant (Loudoun Water) will include a facility for a maximum of 20 employees. Water Treatment Plant operations include truck deliveries limited to an average of 2 trips per day for materials/equipment and service. The site access is proposed as a private road access to the existing turn-around at the south terminus of Gant Lane. A companion SPEX by the Applicant will propose use of a retired Luck Stone Quarry for water storage. The storage area will have minimal traffic impacts on

AI

Mr. George Phillips
Loudoun Water Treatment Plan Parcel 15 Traffic Scope
May 12, 2009
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the public street system (Va. Route 659 or Va. Route 653), except for routine maintenance with access as currently provided.

Pre-Application meeting: Tuesday, March 10, 2009.

VDOT Chapter 527 Requirements

None anticipated; Document existing conditions. Future traffic associated with 20 employees not anticipated to satisfy VDOT Chapter 527 volume criteria. The traffic statement will confirm that uses would generate less than 250 vph and 2,500 vpd new trips for a non-residential rezoning.



Traffic Statement Elements

The following elements should be included in the modified traffic statement:

1. **Study Area:** Include existing site access to Va. Route 652 and at the intersection of Rte 652/653.
2. **Traffic Count Locations:** Provide counts for off-site location for AM and PM peak periods on Route 652 at Cochran Mill Road (Va. Route 653). Document heavy vehicle percentages and include in traffic statement appendix. Compare to Stonewall Center Business Park counts at Route 643/Route 653 to the west of Gant Lane.
3. **Trip Generation:** Calculate for General Industrial use (ITE Code 110) based on 20 employees for the water treatment plant. Check trips in relation to building size.
4. **Traffic Volume Projections:** For traffic statement, assume 2015 operations. No forecasts for build-out plus 10 years.
5. **LOS Analysis:** Calculate intersection operations for existing conditions, with growth (background), and with site.
6. **Minimum Roadway/Intersection LOS Standards:** LOS "D" standards.
7. **Background Traffic Assumptions:** Document VDOT historical growth trends and peak hour counts. Grow through trips on Route 653, based on annual trends. No assignments associated with Stonewall Business center to the east, since not approved. Not assuming improvements to Crosstrail Boulevard.
8. **Traffic/Trip Distribution:** Check existing counts for splits, based on travel time to the east. Assume 50 percent west on Route 653 and 50 percent northeast on Route 653. Assign all truck trips via Route 653 north.

Mr. George Phillips
Loudoun Water Treatment Plan Parcel 15 Traffic Scope
May 12, 2009
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- 9. **LOS Calculations Assumptions:** For isolated unsignalized intersections, capacity using HCS software. Use defaults and existing peak hour factor. Outputs included for existing, background, and total at Route 653/652. Provide CD for HCS analysis.
- 10. **Mode Choice:** Assume no transit service.
- 11. **Safety Locations:** Statement will summarize any road safety hazards as identified by ISTEA set-aside funding criteria for the study area.
- 12. **Traffic Mitigation Measures:** Document improvements, if needed, for safe access. Describe site access with limited access control (no access) to Dulles Greenway.
- 13. **Bicycle & Pedestrian Accommodations:** Identify existing conditions.

Please advise in the signature block below if the work scope is acceptable. Thank you for your assistance on the proposed project. A copy of the authorized work scope will be included in the traffic statement appendix.

Sincerely,

PATTON HARRIS RUST & ASSOCIATES

Douglas R. Kennedy, P.E.
Vice President, Director of Transportation Planning
P:\PROJECT\10348\2-0\corres\PHRA_Loudounwater15_Traffic statement_scope_051209.doc

Acknowledged and accepted this 12th day of May, 2009.

By: George R. Phillips
George R. Phillips

For: Loudoun OTS
Loudoun County Office of Transportation Services

Cc: Karen Arnold - Loudoun Water
Bob Brown - Urban
Laurie Butakis - PHRA

PHR & A TRAFFIC COUNT SUMMARY
Loudoun Water Parcel 15/ Gant Lane F -- 10348-2-0

EW Street: Gant Lane
N/S Street: Cochran Mill Rd
Location: Loudoun County

Source: PHR+A
Date: Tuesday, May 5, 2009
Name: DK

AM 15 Minute Traffic Volumes

	Cochran Mill Rd Northbound			Cochran Mill Rd Southbound			Gant Lane Eastbound			Gant Lane Westbound			Intersection Total			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
6:30 - 6:45 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	4
6:45 - 7:00 AM	0	6	0	0	4	0	0	0	0	0	0	0	0	0	0	10
7:00 - 7:15 AM	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	4
7:15 - 7:30 AM	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
7:30 - 7:45 AM	0	2	0	0	5	0	0	0	0	0	0	0	0	0	0	7
7:45 - 8:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	4
8:00 - 8:15 AM	0	1	1	2	1	3	0	4	1	0	1	2	0	0	0	8
8:15 - 8:30 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	3
8:30 - 8:45 AM	0	2	1	3	1	4	0	5	0	0	1	1	0	0	0	9
8:45 - 9:00 AM	0	2	0	2	0	8	0	8	0	2	0	0	2	0	0	12
AM Peak 15 Minute Traffic Volume	0	2	0	2	0	8	0	8	2	0	0	2	0	0	0	12

AM Hourly Traffic Volumes

	Cochran Mill Rd Northbound			Cochran Mill Rd Southbound			Gant Lane Eastbound			Gant Lane Westbound			Intersection Total			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
6:30 - 7:30 AM	0	11	0	0	12	0	12	0	0	0	0	0	0	0	0	23
6:45 - 7:45 AM	0	11	0	0	15	0	15	0	0	0	0	0	0	0	0	26
7:00 - 8:00 AM	0	7	0	0	13	0	13	0	0	0	0	0	0	0	0	20
7:15 - 8:15 AM	0	5	1	6	1	15	0	16	1	0	1	2	0	0	0	24
7:30 - 8:30 AM	0	6	1	7	1	12	0	13	1	0	1	2	0	0	0	22
7:45 - 8:45 AM	0	6	2	8	2	11	0	13	1	0	2	3	0	0	0	24
8:00 - 9:00 AM	0	6	2	8	2	17	0	19	3	0	2	5	0	0	0	32
AM Peak Hour Traffic Volume	0	6	2	8	2	17	0	19	3	0	2	5	0	0	0	32
PM Peak Hour Factors	1.00			0.59			0.63			0.67						

Trucks/Buses	8:00 - 9:00 AM	0%	13%	18%	16%	20%	16%									
8:00 - 9:00 AM	0	0	1	1	0	3	0	3	1	0	0	1	0	0	0	5

Cochran Mill Road & Gant Lane
 Time: PM Peak Hour
 Location: Leesburg, VA
 Analyst: PHR+A
 File Name : Cochran Mill Road (Route 653) & Gant Lane (Route 652)_PM
 Site Code :
 Start Date : 5/12/2009
 Page No : 1

Groups Printed-

Start Time	Cochran Mill Road (Route 653)						Gant Lane (Route 652)						Cochran Mill Road (Route 653)						Int. Total
	From North			From East			From East			From South			From West						
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
04:00 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
04:15 PM	1	3	1	0	0	5	1	0	0	1	0	0	3	1	4	0	0	0	10
04:30 PM	0	15	2	0	0	17	1	0	0	1	0	0	2	1	3	0	0	0	21
04:45 PM	0	16	0	0	0	16	1	0	0	1	0	0	8	4	12	0	0	0	29
Total	1	38	3	0	0	42	3	0	0	3	0	0	14	5	20	0	0	0	65
05:00 PM	0	10	0	0	0	10	0	0	0	0	0	0	3	1	4	0	0	0	14
05:15 PM	0	5	0	0	0	5	0	0	0	0	0	0	2	0	2	0	0	0	7
05:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	2	0	2	0	0	0	3
05:45 PM	0	2	1	0	0	3	0	0	0	0	0	0	1	0	1	0	0	0	4
Total	0	18	1	0	0	19	0	0	0	0	0	0	8	1	9	0	0	0	28
Grand Total	1	56	4	0	0	61	3	0	0	3	0	0	22	6	29	0	0	0	93
Approch %	1.6	91.8	6.6	0	0	65.6	100	0	0	3.2	0	0	75.9	20.7	31.2	0	0	0	0
Total %	1.1	60.2	4.3	0	0	65.6	3.2	0	0	3.2	0	0	23.7	6.5	31.2	0	0	0	0

Start Time	Cochran Mill Road (Route 653)						Gant Lane (Route 652)						Cochran Mill Road (Route 653)						Int. Total
	From North			From East			From East			From South			From West						
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
04:15 PM	1	3	1	0	0	5	1	0	0	1	0	0	3	0	4	0	0	0	10
04:30 PM	0	15	2	0	0	17	1	0	0	1	0	0	2	1	3	0	0	0	21
04:45 PM	0	16	0	0	0	16	1	0	0	1	0	0	8	4	12	0	0	0	29
05:00 PM	0	10	0	0	0	10	0	0	0	0	0	0	3	1	4	0	0	0	14
Total Volume	1	44	3	0	0	48	3	0	0	3	0	0	16	6	23	0	0	0	74
% App. Total	2.1	91.7	6.2	0	0	70.6	100	0	0	7.5	0	0	69.6	26.1	47.9	0	0	0	63.8
PHF	.250	.688	.375	.000	.000	.706	.750	.000	.000	.750	.000	.000	.500	.375	.479	.000	.000	.000	.638

B2

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	DRK			Intersection	653/652			
Agency/Co.	PHRA			Jurisdiction	Loudoun Co., VA			
Date Performed	5/28/2009			Analysis Year	2009			
Analysis Time Period	AM Peak							
Project Description 10348-2-0 ExistingAM								
East/West Street: Gant Lane				North/South Street: Cochran Mill Rd				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		6	2	17	2			
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.60	0.60	1.00		
Hourly Flow Rate, HFR (veh/h)	0	6	2	28	3	0		
Percent Heavy Vehicles	0	--	--	18	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				3		2		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.60	1.00	0.60		
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	3		
Percent Heavy Vehicles	0	0	0	0	0	20		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		28		7				
C (m) (veh/h)		1514		967				
v/c		0.02		0.01				
95% queue length		0.06		0.02				
Control Delay (s/veh)		7.4		8.7				
LOS		A		A				
Approach Delay (s/veh)	--	--	8.7					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	DRK			Intersection	653/652			
Agency/Co.	PHRA			Jurisdiction	Loudoun Co., VA			
Date Performed	5/28/2009			Analysis Year	2009			
Analysis Time Period	PM Peak							
Project Description 10348-2-0 ExistingPM								
East/West Street: Gant Lane				North/South Street: Cochran Mill Rd				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		22	1	47	1			
Peak-Hour Factor, PHF	1.00	0.50	0.50	0.70	0.70	1.00		
Hourly Flow Rate, HFR (veh/h)	0	44	2	67	1	0		
Percent Heavy Vehicles	0	--	--	6	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				3		0		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.75		
Hourly Flow Rate, HFR (veh/h)	0	0	0	4	0	0		
Percent Heavy Vehicles	0	0	0	2	0	2		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		67		4				
C (m) (veh/h)		1536		775				
v/c		0.04		0.01				
95% queue length		0.14		0.02				
Control Delay (s/veh)		7.5		9.7				
LOS		A		A				
Approach Delay (s/veh)	--	--	9.7					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	DRK			Intersection	653/652		
Agency/Co.	PHRA			Jurisdiction	Loudoun Co., VA		
Date Performed	5/28/2009			Analysis Year	2015		
Analysis Time Period	AM Peak						
Project Description 10348-2-0 BackgroundAM							
East/West Street: Gant Lane				North/South Street: Cochran Mill Rd			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		14	3	40	3		
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.60	0.60	1.00	
Hourly Flow Rate, HFR (veh/h)	0	15	3	66	4	0	
Percent Heavy Vehicles	0	--	--	18	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				5		3	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.60	1.00	0.60	
Hourly Flow Rate, HFR (veh/h)	0	0	0	8	0	4	
Percent Heavy Vehicles	0	0	0	0	0	20	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		66		12			
C (m) (veh/h)		1501		866			
v/c		0.04		0.01			
95% queue length		0.14		0.04			
Control Delay (s/veh)		7.5		9.2			
LOS		A		A			
Approach Delay (s/veh)	--	--	9.2				
Approach LOS	--	--	A				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	DRK			Intersection	653/652		
Agency/Co.	PHRA			Jurisdiction	Loudoun Co., VA		
Date Performed	5/28/2009			Analysis Year	2015		
Analysis Time Period	PM Peak						
Project Description 10348-2-0 BackPM							
East/West Street: Gant Lane				North/South Street: Cochran Mill Rd			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		51	2	109	2		
Peak-Hour Factor, PHF	1.00	0.50	0.50	0.70	0.70	1.00	
Hourly Flow Rate, HFR (veh/h)	0	102	4	155	2	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				5		0	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.75	
Hourly Flow Rate, HFR (veh/h)	0	0	0	6	0	0	
Percent Heavy Vehicles	0	0	0	2	0	2	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11 12
Lane Configuration		LT	LR				
v (veh/h)		155	6				
C (m) (veh/h)		1460	530				
v/c		0.11	0.01				
95% queue length		0.36	0.03				
Control Delay (s/veh)		7.8	11.9				
LOS		A	B				
Approach Delay (s/veh)	--	--	11.9				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	DRK			Intersection	653/652			
Agency/Co.	PHRA			Jurisdiction	Loudoun Co., VA			
Date Performed	5/28/2009			Analysis Year	2015			
Analysis Time Period	AM Peak							
Project Description 10348-2-0 TotalAM								
East/West Street: Gant Lane				North/South Street: Cochran Mill Rd				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		14	7	40	7			
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.60	0.60	1.00		
Hourly Flow Rate, HFR (veh/h)	0	15	7	66	11	0		
Percent Heavy Vehicles	0	--	--	18	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				6		4		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.60	1.00	0.60		
Hourly Flow Rate, HFR (veh/h)	0	0	0	9	0	6		
Percent Heavy Vehicles	0	0	0	0	0	20		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		66		15				
C (m) (veh/h)		1496		871				
v/c		0.04		0.02				
95% queue length		0.14		0.05				
Control Delay (s/veh)		7.5		9.2				
LOS		A		A				
Approach Delay (s/veh)	--	--	9.2					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	DRK			Intersection	653/652		
Agency/Co.	PHRA			Jurisdiction	Loudoun Co., VA		
Date Performed	5/28/2009			Analysis Year	2015		
Analysis Time Period	PM Peak						
Project Description 10348-2-0 TotalPM							
East/West Street: Gant Lane				North/South Street: Cochran Mill Rd			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		51	3	109	3		
Peak-Hour Factor, PHF	1.00	0.50	0.50	0.70	0.70	1.00	
Hourly Flow Rate, HFR (veh/h)	0	102	6	155	4	0	
Percent Heavy Vehicles	0	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				8		3	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.75	
Hourly Flow Rate, HFR (veh/h)	0	0	0	10	0	4	
Percent Heavy Vehicles	0	0	0	2	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		155		14			
C (m) (veh/h)		1458		605			
v/c		0.11		0.02			
95% queue length		0.36		0.07			
Control Delay (s/veh)		7.8		11.1			
LOS		A		B			
Approach Delay (s/veh)	--	--		11.1			
Approach LOS	--	--		B			