TRAFFIC IMPACT STUDY

Proposed Cuyahoga County Public Library
South Euclid Branch
South Green Road

City of South Euclid, Cuyahoga County, Ohio

Prepared For:

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Engineer's Seal

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I. Purpose:

This Traffic Impact Study is being prepared at the request of the Cuyahoga County Public Library in association with the proposed construction of the South Euclid Branch Library located along South Green Road in the City of South Euclid, Ohio. The purpose of this particular Traffic Impact Study is to analyze existing vehicular operating conditions along South Green Road in the vicinity of the proposed library; both before and after its construction to determine what, if any, impact the proposed development will have on vehicular operating conditions within the study area.

II. Project Setting:

Study Area

The subject property is currently located on the west side of South Green Road across from Notre Dame College. See **Figure 1** for the site location map and **Figure 2** of an aerial photograph of the project area. Development in the area is primarily single-family residential with several commercial properties located near the South Green Road / Cedar Road intersection.

Area Roadway System

South Green Road exists as a four lane asphalt roadway in the vicinity of the subject property. The current posted speed limit on South Green Road is 35 miles per hour (mph). Access to the proposed library site will be provided off of South Green Road. According to information obtained from the Ohio Department of Transportation's (ODOT) website, South Green Road within the project area is classified as an Urban Minor Arterial.

There are two (2) existing signalized intersections and two (2) existing unsignalized intersections within the study area and are of special interest to this project. See **Appendix A** for a photo log of the existing roadway conditions. The four (4) intersections included in this study are as follows:

South Green Road / Greenway Road / Golfway Road Intersection:

> This intersection is currently signalized using a simple span wire signal installation suspended from utility poles in the northwest, southeast and southwest quadrants of the intersection. The intersection consists of four (4) approaches with the following lane configurations: NB South Green Road – two (2) lanes (thru-left, thru-right), SB South Green Road – two (2) lanes (left-thru, thru-right), EB Greenway Road – one (1) lane (left-thru-right), and WB Golfway Road – one (1) lane (left-thru-right).

South Green Road / Notre Dame College Drive Intersection:

> This existing intersection is currently stop controlled with the Notre Dame College Drive approach required to stop. The intersection consists of three (3) approaches with the following lane configurations: NB South Green Road – two (2) lanes (thru,

thru- right), SB South Green Road – two (2) lanes (left-thru, thru), and WB Notre Dame College Drive – two (2) lanes (left, right).

South Green Road / College Road Intersection:

This existing intersection is currently stop controlled with the College Road approach required to stop. The intersection consists of three (3) approaches with the following lane configurations: NB South Green Road – two (2) lanes (thru, thru-right), SB South Green Road – two (2) lanes (left-thru, thru), and WB College Road – one (1) lane (left-right).

South Green Road / Cedar Road Intersection:

This intersection is currently signalized using a typical mast arm configuration with signal poles located on all four corners of the intersection. Permissive / protected phases are provided for all left turn movements on each approach. The intersection consists of four (4) approaches with the following lane configurations: NB South Green Road – three (3) lanes (left, thru, thru-right), SB South Green Road – three (3) lanes (left, thru, thru-right), EB Cedar Road – three (3) lanes (left, thru, thru-right), and WB Cedar Road – three (3) lanes (left, thru, thru-right).

Existing Traffic Volumes

For this particular Traffic Study, GPD Group personnel took manual turning movement traffic counts at the following intersections on Tuesday, August 28, 2012 and Thursday, August 30, 2012:

- South Green Road / Greenway Road / Golfway Road
- South Green Road / Notre Dame College Drive
- South Green Road / College Road
- South Green Road / Cedar Road

The turning movement counts were performed for twelve (12) hours from 7:00 AM to 7:00 PM. The 'raw' traffic count data is contained in **Appendix B**. From the count data, the AM peak hour of the study area was determined to be from 7:30 AM to 8:30 AM while the PM peak hour was found to be from 4:30 PM to 5:30 PM. The existing 2012 peak hour traffic volumes are shown in **Figure 3**.

III. Proposed Action:

The proposed development consists of the construction of 30,000 square foot library that will serve as a branch of the Cuyahoga County Public Library system within the City of South Euclid. Access will be provided by a proposed driveway connected to South Green Road that will align with the existing Notre Dame College Drive. See **Figure 4** for the preliminary site layout that identifies the location of the proposed South Euclid Branch Library and access point.

IV. Trip Generation:

The trip generation calculations were performed for the proposed South Euclid Branch Library utilizing the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. This manual includes data from numerous trip generation studies of different land uses that have been performed by public agencies, developers, consulting firms and associations and submitted to ITE. It serves as a tool for estimating the number of vehicle trips generated by a proposed development. For this assessment, the trip generation calculations will evaluate the AM and PM peak periods.

The South Euclid Branch Library was determined to correspond to Land Use 590 (Library). According to information contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, the proposed library could be expected to generate the following trip ends:

Land Use 590 – Library

i. Average Weekday
   = 1,631 trip ends (816 enter and 815 exit)
ii. Weekday AM Peak Hour (i.e. morning rush hour):
   = 34 trip ends (24 enter and 10 exit)
iii. Weekday PM Peak Hour (i.e. afternoon rush hour):
   = 204 trip ends (98 enter and 106 exit)

Note that the independent variable utilized for trip generation for the library land use is square feet of gross floor area, which in this case is 30,000. See **Appendix C** for the detailed trip generation calculations.

V. Projected Traffic Volumes:

Traffic Growth Trends

Historic traffic volumes on Mayfield Road (State Route 322) in the vicinity of the site were obtained from ODOT's website. Based on the available traffic volume data from 2000, 2003, 2007 and 2010 and the growth rate calculations contained in **Appendix D**, it has been determined that the traffic volumes have been decreasing (linearly) by approximately 0.06% per year. While traffic volumes have been decreasing in the study area, an annual growth rate of 0.50% will be used in order to provide a conservative estimate of future traffic projections.

Trip Distribution

The new trips discussed in the previous section were assigned to the roadway network based on existing travel volumes/patterns near the site, the location of the existing library branch being relocated, the location of other area libraries, and engineering judgment. It was estimated that 60% of the projected site trips will travel to/from the north on South Green Road. 10% of the site trips are expected to travel to/from the west on Greenway

Road, while 10% will be expected to travel to/from the south on South Green Road, 10% of the trips will be anticipated to travel to/from the east on Cedar Road, and the remaining 10% will travel to/from the west on Cedar Road. The peak hour distribution and assignment of trips for the proposed South Euclid Branch Library are shown in **Appendix E.**

No-Build Traffic Volumes

The construction of the proposed library is anticipated to be completed by 2013 which will serve as the 'Opening Year' for the study while the 'Design Year' will be 2033. In order to develop the projected future traffic volumes, the annual growth rate of 0.50% was applied linearly to the existing volumes at each intersection to compute the Opening Year 2013 and Design Year 2033 traffic conditions. This increase in traffic accounts for 'background growth' which consists of additional traffic from other non-specific development and general regional growth that could be expected to occur throughout the future years of this study. **Figure 5** illustrates the Opening Year 2013 'No-Build' peak hour traffic volumes while **Figure 6** shows the Design Year 2033 'No-Build' peak hour traffic volumes. The Opening Year 2013 volumes incorporate a 0.50% increase in existing traffic (1 year of growth) while the Design Year 2033 volumes incorporate a 10.50% increase in existing traffic (21 years of growth).

Build Traffic Volumes

In order to create the 'Build' Traffic volumes, the South Euclid Branch Library trip generation volumes discussed above were added to the Opening Day 2013 and Design Year 2033 peak hour traffic volumes. The 'Build' traffic volumes will allow a direct comparison between the projected traffic conditions without the development and those following the completion of the proposed library without any influence from other sources such as regional growth or other developments. **Figure 7** illustrates the Opening Year 2013 'Build' peak hour traffic volumes while **Figure 8** shows the Design Year 2033 'Build' peak hour traffic volumes.

VI. Traffic Analysis:

Traffic Signal Warrants

Utilizing the existing and proposed traffic volumes, as specified in Section 402-2 of the ODOT Traffic Engineering Manual (TEM), traffic signal warrant analyses were performed for the each of the four (4) study intersections. A traffic signal is considered warranted for construction if at least one (1) of a possible nine (9) 2009 Manual of Traffic Control Devices (MUTCD) warrant requirements are satisfied. Because of the availability of twelve (12) hour turning movement traffic count data at the existing intersections, three (3) of the nine (9) possible warrant requirements were deemed applicable for the Existing Year 2012 warrant analysis (i.e. Warrants #1, #2, and #3). For the 'Build' analysis, only Warrant #3 (peak hour vehicular volume) was analyzed for the projected Opening Year 2013 traffic volumes. The warrants are described as follows:

Warrant #1 Eight Hour Vehicular Volume

The Eight Hour Vehicular Volume warrant is intended for application where the volume of intersection traffic is the principal reason for consideration of the signal installation. Three (3) conditions are possible to satisfy this particular warrant. Condition A applies to specifically minimum vehicular volume requirements. Condition B deals with the interruption of continuous traffic flow. Condition C represents a combination of Conditions A and B being met at reduced volume requirements. When the 85th percentile speed of the major street traffic exceeds 40 mph in either an urban or rural area, or when the intersection lies within a built-up area of an isolated community having a population less than 10,000, the Eight Hour Vehicular Volume Warrant is seventy percent (70%) of the base requirements.

Warrant #2 Four Hour Vehicular Volume

The Four Hour Vehicular Volume warrant is satisfied when for four (4) hours of an average day, minimum volumes are reached on both the major street (total of both approaches) and the highest volume minor street approach (one direction only). When the 85th percentile speed of the major street traffic exceeds 40 mph or when the intersection lies within a built-up area of an isolated community having a population less than 10,000, the Four Hour Vehicular Volume requirements are reduced to seventy percent (70%) of the base values.

Warrant #3 Peak Hour Vehicular Volume

The Peak Hour Vehicular Volume warrant is intended for application when traffic conditions are such that for one hour of the day, minor street traffic suffers undue delay in entering or crossing the major street. The Peak Hour Vehicular Volume warrant is satisfied when the minimum required volumes on the major and highest volume minor approach are met for any one hour period (any four consecutive 15-minute periods) on an average day. When the 85th percentile speed of the major street traffic exceeds 40 mph or when the intersection lies within a built up area of an isolated community having a population less than 10,000, the Peak Hour Vehicular Volume warrants are reduced.

In order to determine whether the existing intersections meet the warrant requirements to justify a traffic signal based on the current traffic conditions, the existing traffic data was compared to the volume thresholds for each of the three (3) volume warrants. The results of the Existing Year 2012 traffic signal warrant analysis are shown in **Table 1** on the following page. See **Appendix F** for the traffic signal warrant analysis.

Table 1: Traffic Signal Warrant Analysis Summary – Existing Year 2012 Conditions			
Intersection	Signal Warrants		
	Warrant #1 (Eight Hour Volume)	Warrant #2 (Four Hour Volume)	Warrant #3 (Peak Hour Volume)
South Green Road / Cedar Road	**Satisfied**	**Satisfied**	**Satisfied**
South Green Road / College Road	Not Satisfied	Not Satisfied	Not Satisfied
South Green Road / Notre Dame College Drive	Not Satisfied	Not Satisfied	Not Satisfied
South Green Road / Greenway Road / Golfway Road	Not Satisfied	Not Satisfied	Not Satisfied

As shown in **Table 1** above, a traffic signal is still warranted at the signalized intersection of South Green Road / Cedar Road based on the current traffic volumes. The signalized intersection of South Green Road / Greenway Road / Golfway Road the and unsignalized intersections of South Green Road / Notre Dame College Drive and South Green Road / College Road did not meet any volume thresholds to warrant a traffic signal based on current traffic conditions.

Since the traffic volumes are anticipated to increase in future years due to the addition of site traffic and background growth, the projected Opening Year 2013 'Build' traffic volumes at the study intersections were compared to the volume thresholds for the peak hour warrant (Warrant #3). The results of the Opening Year 2013 'Build' traffic signal warrant analysis are shown in **Table 2**. See **Appendix F** for the traffic signal warrant analysis.

Table 2: Traffic Signal Warrant Analysis Summary – Opening Year 2013 'Build' Conditions	
Intersection	Signal Warrant
	Warrant #3 (Peak Hour Volume)
South Green Road / Cedar Road	**Satisfied**
South Green Road / College Road	Not Satisfied
South Green Road / Notre Dame College Drive / Library Drive	Not Satisfied
South Green Road / Greenway Road / Golfway Road	Not Satisfied

Even with the completion of the South Euclid Branch Library, no additional intersections are anticipated to warrant a traffic signal as shown in **Table 2** based on the Opening Year 2013 'Build' traffic volumes.

HCS Intersection Capacity Analysis

Intersection capacity analyses were performed for the Existing Year 2012, Opening Year 2013, and Design Year 2033 conditions in order to determine the operating conditions experienced by each intersection. The quality of the operating conditions experienced by an intersection is measured in terms of Level-of-Service (LOS). Levels-of-Service can range from LOS A to LOS F. Level-of-Service ratings of A, B, and C are considered to be in the acceptable range. Level-of-Service D is typically considered acceptable in urban areas (which the subject property and study area utilized for this project have been determined to be within). Levels-of-Service E and F are considered below average with significant levels of delay experienced by vehicles.

The analysis has been performed utilizing the computer program HCS2010 which was developed by McTrans Corporation and based on the 2010 Highway Capacity Manual and the 2009 Manual of Uniform Traffic Control Devices (MUTCD). Based on criteria established by ODOT, Highway Capacity Software (HCS) is used to determine the required number of lanes and the lane assignments at intersections (i.e. the needed intersection capacity). The analysis was performed for each intersection during the AM and PM peak hours. **Table 3** summarizes the HCS Intersection Capacity Analysis and details the Levels-of-Service and delay experienced under the Existing Year 2012 traffic conditions. See **Appendix G** for the HCS intersection capacity analysis

Table 3: HCS Intersection Capacity Analysis Summary – Existing Year 2012 Conditions

Intersection / Movement	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
South Green Road / Cedar Road				
Eastbound Left	B	19.4	C	21.3
Eastbound Thru	D	36.7	D	37.1
Eastbound Right	D	37.0	D	37.4
Eastbound Approach	*D*	*35.1*	*D*	*35.4*
Westbound Left	C	20.8	C	23.5
Westbound Thru	C	34.0	D	35.5
Westbound Right	C	34.4	D	36.0
Westbound Approach	*C*	*32.7*	*C*	*34.0*
Northbound Left	C	23.8	C	24.2
Northbound Thru	C	34.0	C	33.6
Northbound Right	C	32.0	C	34.2
Northbound Approach	*C*	*30.6*	*C*	*31.4*
Southbound Left	C	34.8	C	34.8
Southbound Thru	D	35.2	D	35.5
Southbound Right	D	35.8	D	36.5
Southbound Approach	*D*	*35.2*	*D*	*35.5*
Intersection Total	***C***	***33.9***	***C***	***34.4***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

Table 3: HCS Intersection Capacity Analysis Summary – Existing Year 2012 Conditions (cont.)				
Intersection / Movement	**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
South Green Road / College Road				
Westbound Left-Right	B	11.3	B	13.5
Westbound Approach	B	11.3	B	13.5
Southbound Left-Thru	A	9.2	A	8.9
South Green Road / Notre Dame College Drive				
Westbound Left	D	28.5	E	38.8
Westbound Right	B	10.0	B	10.8
Westbound Approach	*C*	*22.4*	*D*	*29.0*
Southbound Left-Thru	A	9.3	A	9.5
South Green Road / Greenway Road / Golfway Road				
Eastbound Left-Thru-Right	B	12.3	B	12.1
Eastbound Approach	*B*	*12.3*	*B*	*12.1*
Westbound Left-Thru-Right	B	12.2	B	11.9
Westbound Approach	*B*	*12.2*	*B*	*11.9*
Northbound Left-Thru	B	*11.6*	B	*11.6*
Northbound Thru-Right	B	11.9	B	11.9
Northbound Approach	*B*	*11.7*	*B*	*11.7*
Southbound Left-Thru	B	12.0	B	12.0
Southbound Thru-Right	N/A	—	B	12.3
Southbound Approach	B	12.2	B	12.1
Intersection Total	***B***	***12.0***	***B***	***11.9***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

As shown in **Table 3**, the Existing Year 2012 traffic conditions indicate that all the study intersections, with the exception of the South Green Road / Notre Dame College Drive intersection, are currently operating at an acceptable LOS D or better during the AM and PM peak hours. The westbound left turn movement at the South Green Road / Notre Dame College Drive intersection is found to be operating at LOS E during the PM peak hour.

Table 4 on the following pages compares the HCS Intersection Capacity Analysis and details the Levels-of-Service and delay experienced for the Opening Year 2013 'No-Build' conditions and the Opening Year 2013 'Build' conditions. See **Appendix G** for the HCS Intersection Capacity Analysis printouts.

Table 4: HCS Intersection Capacity Analysis Summary – Opening Year 2013 Conditions

Intersection / Movement	'No-Build' Conditions				'Build' Conditions			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
South Green Road / Cedar Road								
Eastbound Left	C	19.6	C	21.8	B	19.8	C	23.1
Eastbound Thru	D	36.9	D	37.9	D	37.2	D	38.7
Eastbound Right	D	37.2	D	38.2	D	37.5	D	39.0
Eastbound Approach	*D*	*35.4*	*D*	*36.1*	*D*	*35.6*	*D*	*36.9*
Westbound Left	C	21.0	C	24.0	C	21.1	C	24.3
Westbound Thru	C	34.2	D	36.8	C	34.6	D	38.3
Westbound Right	C	34.6	D	37.3	C	35.0	D	38.8
Westbound Approach	*C*	*32.9*	*D*	*35.2*	*C*	*33.2*	*D*	*36.6*
Northbound Left	C	23.9	C	24.3	C	23.8	C	24.2
Northbound Thru	C	34.1	C	33.6	C	34.1	C	33.5
Northbound Right	C	32.0	C	34.3	C	31.9	C	34.1
Northbound Approach	*C*	*30.7*	*C*	*31.4*	*C*	*30.7*	*C*	*31.4*
Southbound Left	D	35.5	D	35.7	D	35.6	D	37.5
Southbound Thru	D	35.3	D	35.6	D	35.2	D	36.0
Southbound Right	D	35.9	D	36.6	D	35.8	D	37.0
Southbound Approach	*D*	*35.5*	*D*	*36.0*	*D*	*35.6*	*D*	*36.9*
Intersection Total	***C***	***34.1***	***D***	***35.1***	***C***	***34.3***	***D***	***36.0***
South Green Road / College Road								
Westbound Left-Right	B	11.4	B	13.7	B	11.5	B	14.2
Westbound Approach	*B*	*11.4*	*B*	*13.7*	B	11.5	B	14.2
Southbound Left-Thru	A	8.4	A	8.9	A	8.5	A	9.0
South Green Road / Notre Dame College Drive / Library Drive								
Eastbound Left-Thru-Right	N/A	—	N/A	—	C	21.9	F	61.6
Eastbound Approach	*N/A*	—	*N/A*	—	*C*	*21.9*	*F*	*61.6*
Westbound Left	D	25.6	E	40.0	D	30.9	F	79.1
Westbound Thru-Right	B	10.1	B	10.8	B	10.1	B	10.8
Westbound Approach	*C*	*20.4*	*D*	*29.8*	*C*	*24.0*	*F*	*55.1*
Northbound Left-Thru	N/A	—	N/A	—	A	8.5	A	9.1
Southbound Left-Thru	A	9.4	A	9.6	A	9.4	A	9.6

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

Table 4: HCS Intersection Capacity Analysis Summary – Opening Year 2013 Conditions (Cont.)								
Intersection / Movement	**'No-Build' Conditions**				**'Build' Conditions**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**
South Green Road / Greenway Road / Golfway Road								
Eastbound Left-Thru-Right	B	12.3	B	12.2	B	12.4	B	12.5
Eastbound Approach	*B*	*12.3*	*B*	*12.2*	*B*	*12.4*	*B*	*12.5*
Westbound Left-Thru-Right	B	12.2	B	12.0	B	12.2	B	12.2
Westbound Approach	*B*	*12.2*	*B*	*12.0*	*B*	*12.2*	*B*	*12.2*
Northbound Left-Thru	B	11.6	B	11.5	B	11.7	B	11.8
Northbound Thru-Right	B	11.9	B	11.8	B	12.0	B	12.3
Northbound Approach	*B*	*11.8*	*B*	*11.7*	*B*	*11.8*	*B*	*12.1*
Southbound Left-Thru	B	12.0	B	12.0	B	12.1	B	12.2
Southbound Thru-Right	N/A	—	B	12.4	N/A	—	B	12.7
Southbound Approach	*B*	*12.2*	*B*	*12.2*	*B*	*12.3*	*B*	*12.4*
Intersection Total	***B***	***12.0***	***B***	***12.0***	***B***	***12.1***	***B***	***12.3***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

As shown in **Table 4**, all intersections are expected to continue to operate at LOS D or better under the Opening Year 2013 'No-Build' and 'Build' conditions with the exception of the South Green Road / Notre Dame College Drive / Library Drive intersection. While the westbound left turn movement at this intersection was found to continue to operate at LOS E during the PM peak hour of the Opening Year 2013 'No-Build' conditions, the addition of the Library Drive and the associated site traffic to this intersection results in both the eastbound and westbound approaches operating at LOS F during that timeframe under the 'Build' conditions.

Table 5 on the following pages summarizes the HCS Intersection Capacity Analysis and details the Levels-of-Service and delay experienced for the Design Year 2033 'No-Build' conditions and the Design Year 2033 'Build' conditions. See **Appendix G** for the HCS intersection capacity analysis.

Table 5: HCS Intersection Capacity Analysis Summary – Design Year 2033 Conditions								
Intersection / Movement	**'No-Build' Conditions**				**'Build' Conditions**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**
South Green Road / Cedar Road								
Eastbound Left	C	21.2	C	24.3	C	21.5	C	25.7
Eastbound Thru	D	42.1	D	43.5	D	42.5	D	44.8
Eastbound Thru-Right	D	42.6	D	44.0	D	42.9	D	45.3
Eastbound Approach	*D*	*40.3*	*D*	*41.4*	*D*	*40.6*	*D*	*42.6*
Westbound Left	C	23.1	C	27.1	C	23.1	C	27.5
Westbound Thru	D	37.7	D	41.5	D	38.1	D	43.7
Westbound Thru-Right	D	38.2	D	42.1	D	38.6	D	44.4
Westbound Approach	*D*	*36.3*	*D*	*39.7*	*D*	*36.7*	*D*	*41.7*
Northbound Left	C	24.9	C	25.5	C	24.8	C	25.4
Northbound Thru	D	35.7	D	35.1	D	35.7	D	35.0
Northbound Thru-Right	C	33.1	D	35.9	C	33.0	D	35.8
Northbound Approach	*C*	*32.0*	*C*	*32.9*	*C*	*32.0*	*C*	*32.9*
Southbound Left	D	43.6	D	45.1	D	44.0	D	48.4
Southbound Thru	D	37.3	D	37.9	D	37.2	D	38.3
Southbound Thru-Right	D	38.1	D	39.1	D	38.0	D	39.7
Southbound Approach	*D*	*40.4*	*D*	*41.2*	*D*	*40.5*	*D*	*42.9*
Intersection Total	***D***	***38.1***	***D***	***39.7***	***D***	***38.3***	***D***	***41.0***
South Green Road / College Road								
Westbound Left-Right	B	11.9	C	15.1	B	12.0	C	15.7
Westbound Approach	*B*	*11.9*	*C*	*15.1*	B	12.0	C	15.7
Southbound Left-Thru	A	8.6	A	9.2	A	8.6	A	9.3
South Green Road / Notre Dame College Drive / Library Drive								
Eastbound Left-Thru-Right	N/A	—	N/A	—	D	25.1	F	93.9
Eastbound Approach	*N/A*	—	*N/A*	—	*D*	*25.1*	*F*	*93.9*
Westbound Left	D	30.2	F	59.6	E	37.4	F	143.1
Westbound Thru-Right	B	10.3	B	11.2	B	10.3	B	11.2
Westbound Approach	*C*	*23.3*	*E*	*42.6*	*D*	*28.0*	*F*	*96.7*
Northbound Left-Thru	N/A	—	N/A	—	A	8.6	A	9.3
Southbound Left-Thru	A	9.8	A	9.9	A	9.8	A	9.9

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

Table 5: HCS Intersection Capacity Analysis Summary – Design Year 2033 Conditions (Cont.)								
Intersection / Movement	**'No-Build' Conditions**				**'Build' Conditions**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**
South Green Road / Greenway Road / Golfway Road								
Eastbound Left-Thru-Right	B	12.5	B	12.5	B	12.6	B	12.8
Eastbound Approach	*B*	*12.5*	*B*	*12.5*	*B*	*12.6*	*B*	*12.8*
Westbound Left-Thru-Right	B	12.4	B	12.3	B	12.5	B	12.4
Westbound Approach	*B*	*12.4*	*B*	*12.3*	*B*	*12.5*	*B*	*12.4*
Northbound Left-Thru	B	11.9	B	11.6	B	11.8	B	12.0
Northbound Thru-Right	B	12.2	B	11.9	B	12.2	B	12.5
Northbound Approach	*B*	*12.0*	*B*	*11.8*	*B*	*12.0*	*B*	*12.3*
Southbound Left-Thru	B	12.3	B	12.2	B	12.3	B	12.5
Southbound Thru-Right	N/A	—	B	12.6	N/A	—	B	13.0
Southbound Approach	*B*	*12.5*	*B*	*12.4*	*B*	*12.5*	*B*	*12.7*
Intersection Total	***B***	***12.3***	***B***	***12.1***	***B***	***12.3***	***B***	***12.5***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F

As shown in **Table 5**, all intersections are expected to continue to operate at LOS D or better under the Design Year 2033 'No-Build' and 'Build' conditions with the exception of the South Green Road / Notre Dame College Drive / Library Drive intersection. The westbound left turn movement and westbound approach at this location were found to operate at a LOS F and LOS E, respectively, during the PM peak hour under the 'No-Build' conditions. This indicates that the Notre Dame College Drive will likely degrade to a Level-of-Service of F in the future, with or without the construction of the proposed library, as an unsignalized stop-controlled approach. Similar to the Opening Year 2013 conditions, the eastbound and westbound approaches will both be expected to operate at LOS F following the addition of the Library Drive and associated site traffic under the Design Year 2033 'Build' conditions.

Potential Driveway Reconfiguration

The current site plan for the library proposes to align the new site driveway, which will consist of one (1) inbound lane and one (1) outbound lane, with the Notre Dame College Drive. A review of this existing drive on the east side of South Green Road reveals that the it currently has a width of approximately 90 feet with two (2) inbound lanes, two (2) outbound lanes consisting of a left turn lane and a right turn lane, followed by an additional inbound lane on the far side of the driveway. This additional inbound lane, which previously served the loop in front of the former Regina High School, is likely no longer utilized as the now-defunct school has been acquired by Notre Dame College. The two (2) inbound lanes and the two (2) outbound lanes are separated by and raised landscaped median approximately 100 feet into the property.

Due to safety issues that can be created by opposing driveways that have inbound and outbound lanes which are not properly aligned, it is proposed that the existing Notre Dame College Drive could be reconfigured to provide a single inbound lane and a single outbound lane which should be located at the location of the two (2) existing inbound lanes currently located south of the raised landscaped median. The pavement utilized for the two (2) existing outbound lanes (north of the landscaped median) along with the additional inbound lane serving the former Regina High School loop should be removed and replaced with green space. This modification would allow the outbound lane of the proposed Library Drive to align with the inbound lane of Notre Dame College Drive while the outbound lane of the Notre Dame College Drive would then align with the inbound lane of the proposed Library Drive. This would help minimize the potential for left turn conflicts when vehicles are exiting both sites onto South Green Road and eliminate the nonconventional layout of the existing Notre Dame College Drive. See **Figure 9** for a conceptual rendering of the potential driveway alignment and reconfiguration.

Under this potential scenario, with the reduction of the Notre Dame College Drive to a single outbound lane, the traffic signal warrants were reevaluated based on the existing year traffic volumes. The results of the Existing Year 2012 'Potential Reconfiguration' traffic signal warrant analysis are shown in **Table 6** below**.** See **Appendix H** for the modified traffic signal warrant analysis.

Table 6: Traffic Signal Warrant Analysis Summary –
Existing Year 2012 'Potential Reconfiguration' Conditions

Intersection	Signal Warrants		
	Warrant #1 (Eight Hour Volume)	Warrant #2 (Four Hour Volume)	Warrant #3 (Peak Hour Volume)
South Green Road / Notre Dame College Drive	**Satisfied**	Not Satisfied	Not Satisfied

As shown in **Table 6**, the South Green Road / Notre Dame College Drive intersection would warrant a traffic signal with a single lane approach based on the Existing 2012 traffic conditions. This analysis found that Warrant #1 (the eight hour volume warrant) was met indicating that a consistent volume of traffic currently utilizes this drive to exit the Notre Dame College campus throughout the day. The potential reconfiguration of the existing drive to better align with the proposed Library Drive would justify the installation of a traffic signal at this intersection even without the addition of the future library traffic.

Capacity analyses were performed for the reconfigured South Green Road / Notre Dame College Drive / Library Drive intersection to account for the potential Notre Dame College Drive Reconfiguration and the installation of the warranted traffic signal. **Table 7** on the following page summarizes the HCS Intersection Capacity Analysis and details the Levels-of-Service and delay experienced under the Opening Year 2013 'Potential Reconfiguration' traffic conditions. See **Appendix I** for the modified HCS intersection capacity analysis.

Table 7: HCS Intersection Capacity Analysis Summary – Opening Year 2013 'Potential Reconfiguration' Conditions				
Intersection / Movement	**AM Peak**		**PM Peak**	
	LOS	**Delay** (sec)	**LOS**	**Delay** (sec)
South Green Road / Notre Dame College Drive / Library Drive				
Eastbound Left-Thru-Right	B	13.8	B	13.8
Eastbound Approach	*B*	*13.8*	*B*	*13.8*
Westbound Left-Thru-Right	B	14.0	B	14.0
Westbound Approach	*B*	*14.0*	*B*	*14.0*
Northbound Left-Thru	B	10.0	B	13.2
Northbound Thru-Right	B	10.5	B	14.2
Northbound Approach	*B*	*10.2*	*B*	*13.7*
Southbound Left-Thru	B	17.3	B	13.2
Southbound Thru-Right	B	13.1	B	14.5
Southbound Approach	*B*	*14.1*	*B*	*13.9*
Intersection Total	***B***	***12.2***	***B***	***13.8***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

As shown in **Table 7**, the Opening Year 2013 traffic conditions indicated that all movements and approaches at the South Green Road / Notre Dame College Drive / Library Drive intersection would be anticipated to operate at LOS B during both the AM and PM peak hours following the construction of the proposed potential reconfiguration of the Notre Dame College Drive and the installation of the warranted traffic signal. If constructed, these potential reconfigurations have proven to mitigate the unacceptable Levels-of-Service that will be expected following the opening of the library if the intersection remains unsignalized with both side street approaches operating under stop-control.

Table 8 on the following page summarizes the HCS Intersection Capacity Analysis and details the Levels-of-Service and delay experienced under the Design Year 2033 'Potential Reconfiguration' traffic conditions. See **Appendix I** for the modified HCS intersection capacity analysis.

Table 8: HCS Intersection Capacity Analysis Summary – Design Year 2033 'Potential Reconfiguration' Conditions				
Intersection / Movement	**AM Peak**		**PM Peak**	
	LOS	**Delay (sec)**	**LOS**	**Delay (sec)**
South Green Road / Notre Dame College Drive / Library Drive				
Eastbound Left-Thru-Right	B	14.6	B	14.3
Eastbound Approach	*B*	*14.6*	*B*	*14.3*
Westbound Left-Thru-Right	B	14.8	B	14.8
Westbound Approach	*B*	*14.8*	*B*	*14.8*
Northbound Left-Thru	A	9.6	B	13.4
Northbound Thru-Right	B	10.1	B	14.5
Northbound Approach	*A*	*9.8*	*B*	*13.9*
Southbound Left-Thru	B	19.3	B	13.8
Southbound Thru-Right	B	13.7	B	15.3
Southbound Approach	*B*	*14.8*	*B*	*14.7*
Intersection Total	***B***	***12.3***	***B***	***14.3***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.

As shown in **Table 8**, the Design Year 2033 traffic conditions indicated that all movements and approaches at the South Green Road / Notre Dame College Drive / Library Drive intersection would be anticipated to operate at LOS A or B during both the AM and PM peak hours following the construction of the proposed potential reconfiguration of the Notre Dame College Drive and the installation of the warranted traffic signal. If constructed, these potential reconfigurations have again proven to mitigate the unacceptable Levels-of-Service that will be expected following the opening of the library if the intersection remains unsignalized with both side street approaches operating under stop-control.

VII. Summary and Recommendations:

This Traffic Impact Study is being prepared at the request of the Cuyahoga County Public Library in association with the proposed construction of the South Euclid Branch Library located along South Green Road in the City of South Euclid, Ohio. The purpose of this particular Traffic Impact Study is to analyze existing vehicular operating conditions along South Green Road in the vicinity of the proposed library; both before and after its construction to determine what, if any, impact the proposed development will have on vehicular operating conditions within the study area.

In Summary,

1. The proposed South Euclid Branch Library could be expected to generate the following trip ends:
   i. Average Weekday
      = 1,631 trip ends (816 enter and 815 exit)
   ii. Weekday AM Peak Hour (i.e. morning rush hour):
      = 34 trip ends (24 enter and 10 exit)
   iii. Weekday PM Peak Hour (i.e. afternoon rush hour):
      = 204 trip ends (98 enter and 106 exit)

2. It was determined that a traffic signal is warranted at the existing signalized intersection of South Green Road / Cedar Road based on the current traffic volumes while the South Green Road / Greenway Road / Golfway Road intersection, South Green Road / Notre Dame College Drive, and the South Green Road / College Road intersection did not warrant a signal. These three (3) intersections are not anticipated to meet traffic signal warrants under the Opening Day 2013 'Build' conditions based on the projected peak hour volumes and the existing intersection configurations.

3. The Existing Year 2012 traffic conditions indicate that the all study intersections, with the exception of the South Green Road / Notre Dame College Drive intersection, are currently operating at an acceptable LOS D or better during the AM and PM peak hours. The westbound left turn movement at the South Green Road / Notre Dame College Drive intersection was found to be operating at LOS E during the PM peak hour.

4. All study intersections are expected to continue to operate at LOS D or better under the Opening Year 2013 'No-Build' and 'Build' conditions with the exception of the South Green Road / Notre Dame College Drive / Library Drive intersection. While the westbound left turn movement at this intersection was found to continue to operate at LOS E during the PM peak hour of the 'No-Build' conditions, the addition of the Library Drive and the associated site traffic to this intersection results in both the eastbound and westbound approaches operating at LOS F during that timeframe under the 'Build' conditions.

5. All study intersections are expected to continue to operate at LOS D or better under the Design Year 2033 'No-Build' and 'Build' conditions with the

exception of the South Green Road / Notre Dame College Drive / Library Drive intersection. The westbound left turn movement and westbound approach at this location were found to operate at a LOS F and LOS E, respectively, during the PM peak hour under the 'No-Build' conditions. This indicates that the Notre Dame College Drive will likely degrade to a Level-of-Service of F in the future, with or without the construction of the proposed library, as an unsignalized stop-controlled approach. Similar to the Opening Year 2013 conditions, the eastbound and westbound approaches will both be expected to operate at LOS F following the addition of the Library Drive and associated site traffic under the Design Year 2033 'Build' conditions.

6. If possible through working with Notre Dame College, due to safety issues that can be created by opposing driveways that have inbound and outbound lanes which are not properly aligned, it is suggested that the existing Notre Dame College Drive could be reconfigured to provide a single inbound lane and a single outbound lane to be located at the location of the two (2) existing current inbound lanes which are currently located south of the raised landscaped median. The pavement utilized for the two (2) existing outbound lanes along with the additional inbound lane serving the former Regina High School loop should be removed and replaced with green space.

7. Following the construction of the potential reconfiguration, a traffic signal would be warranted at the South Green Road / Notre Dame College Drive intersection based on Existing 2012 traffic volumes.

8. The South Green Road / Notre Dame College Drive / Library Drive intersection is expected to operate at LOS B or better under the Opening Year 2013 and Design Year 2033 conditions following the construction of the potential reconfiguration of the Notre Dame College Drive and installation of the warranted traffic signal.

Based on the information and analyses in this study, GPD Group recommends the following:

1. The proposed South Euclid Branch Library should be constructed with access to South Green Road as shown in the current site plan.

2. Assuming Notre Dame College is accepting of the proposed reconfiguration solution, the existing Notre Dame College Drive should be reconfigured to provide a single inbound lane and a single outbound lane to be located at the location of the two (2) existing inbound lanes currently located south of the raised landscaped median. The pavement utilized for the two (2) existing outbound lanes along with the additional inbound lane serving the former Regina High School loop should be removed and replaced with green space.

3. Following the reconfiguration of the Notre Dame College Drive, the warranted traffic signal should then be installed at the South Green Road / Notre Dame College Drive intersection along with the construction of the new Library Drive.

FIGURES

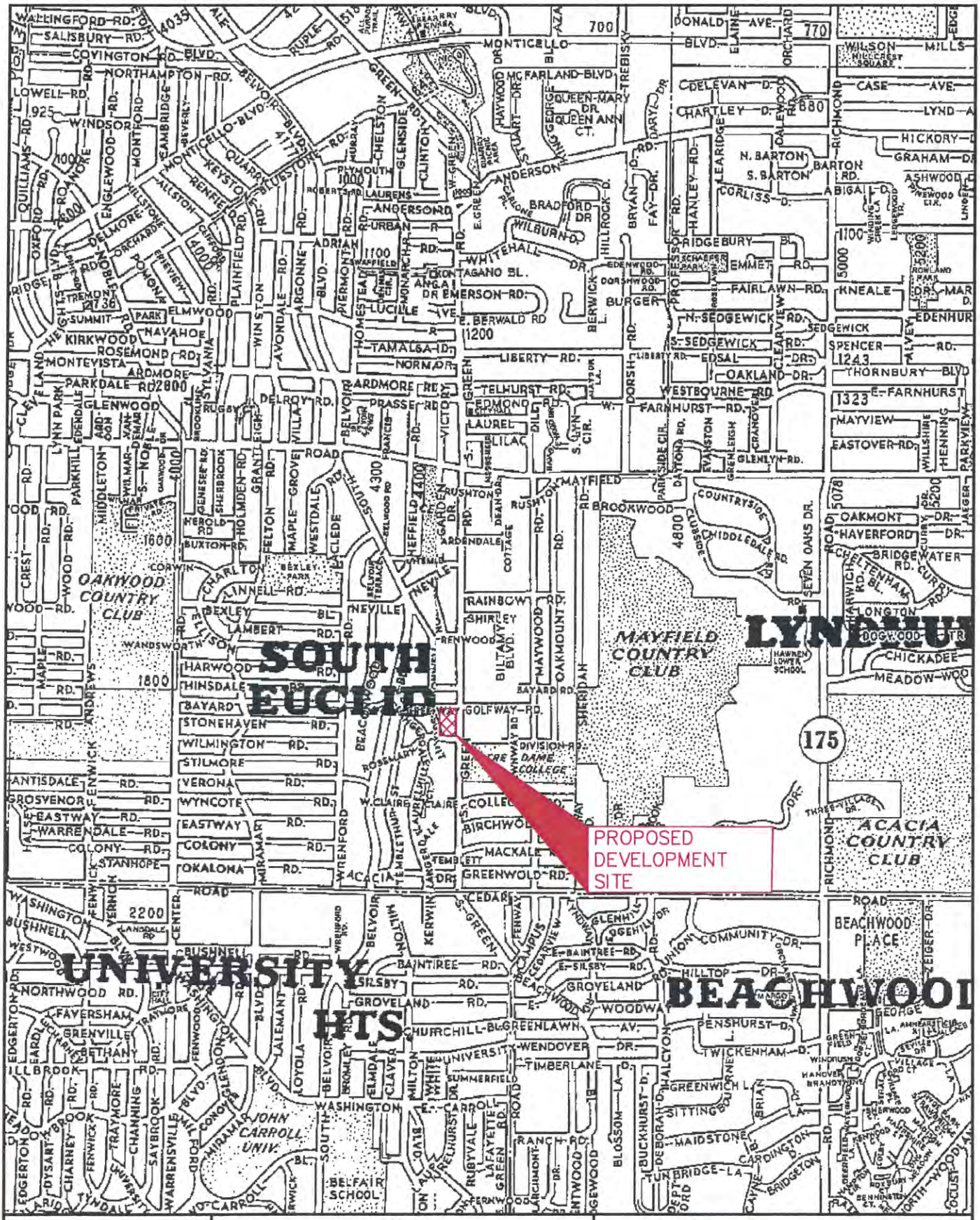

FIGURE 1

SITE LOCATION MAP

N.T.S.

JANUARY 2013

GPD GROUP

520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

CAD FILE G:\2012\2012154\TRAFFIC\DWG\PROJECT LOCATION.DWG
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FIGURE 2

AERIAL PHOTOGRAPH

JANUARY 2013

N

N.T.S.

GPD GROUP

520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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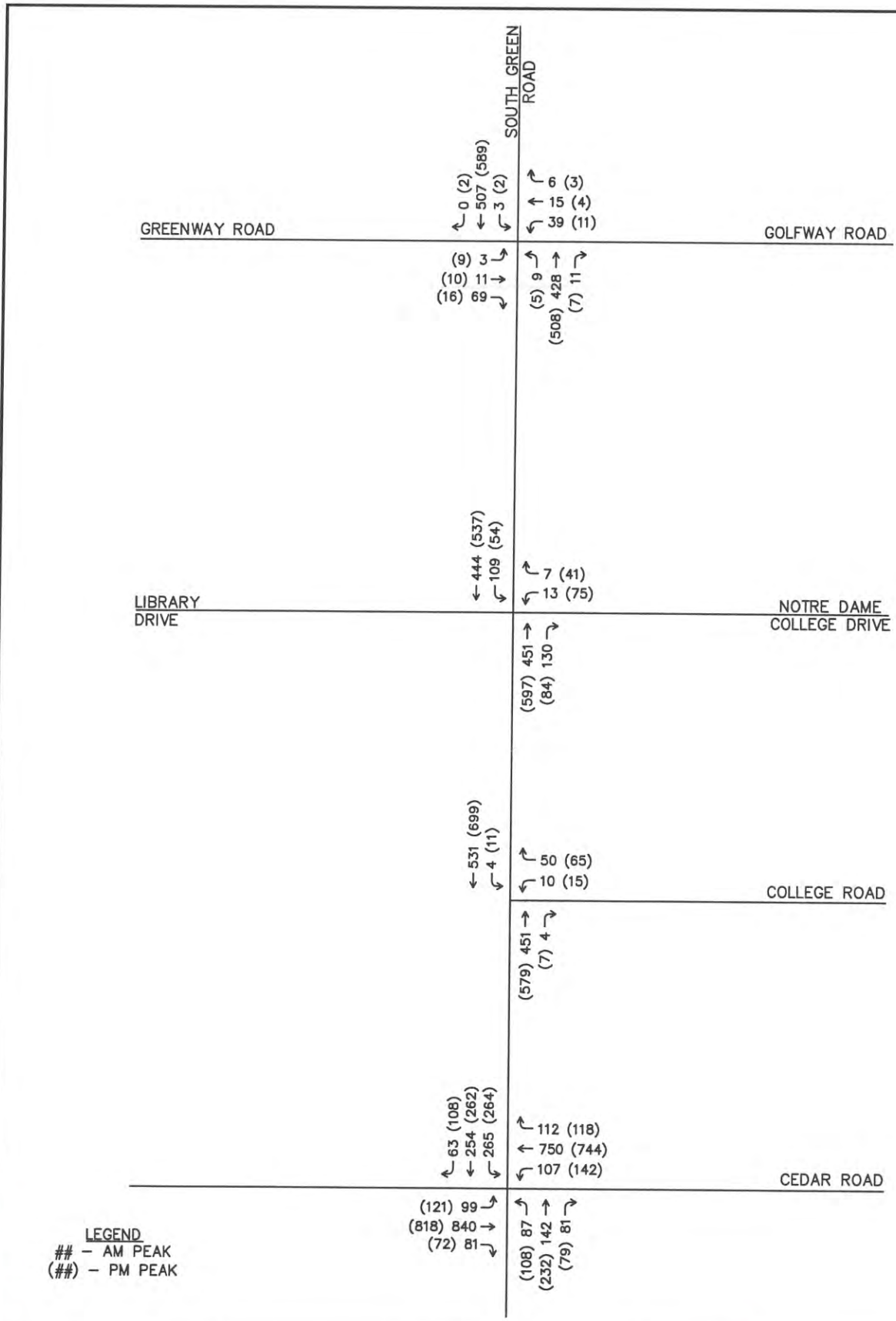

N

N.T.S.

FIGURE 3

EXISTING YEAR 2012
TRAFFIC VOLUMES

JANUARY 2013

GPD GROUP
520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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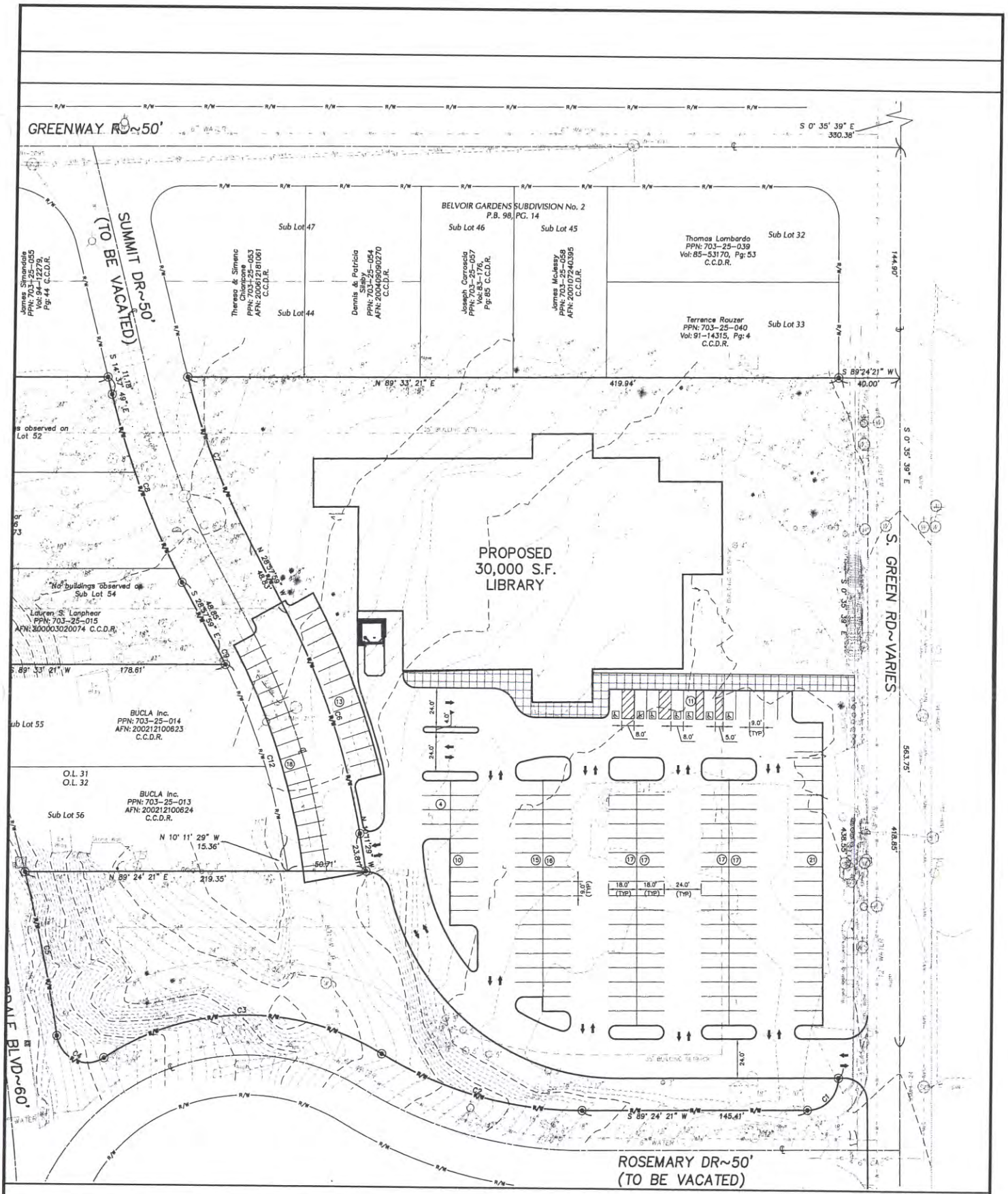

FIGURE 4

PRELIMINARY SITE PLAN

JANUARY 2013

N

N.T.S.

GPD GROUP
520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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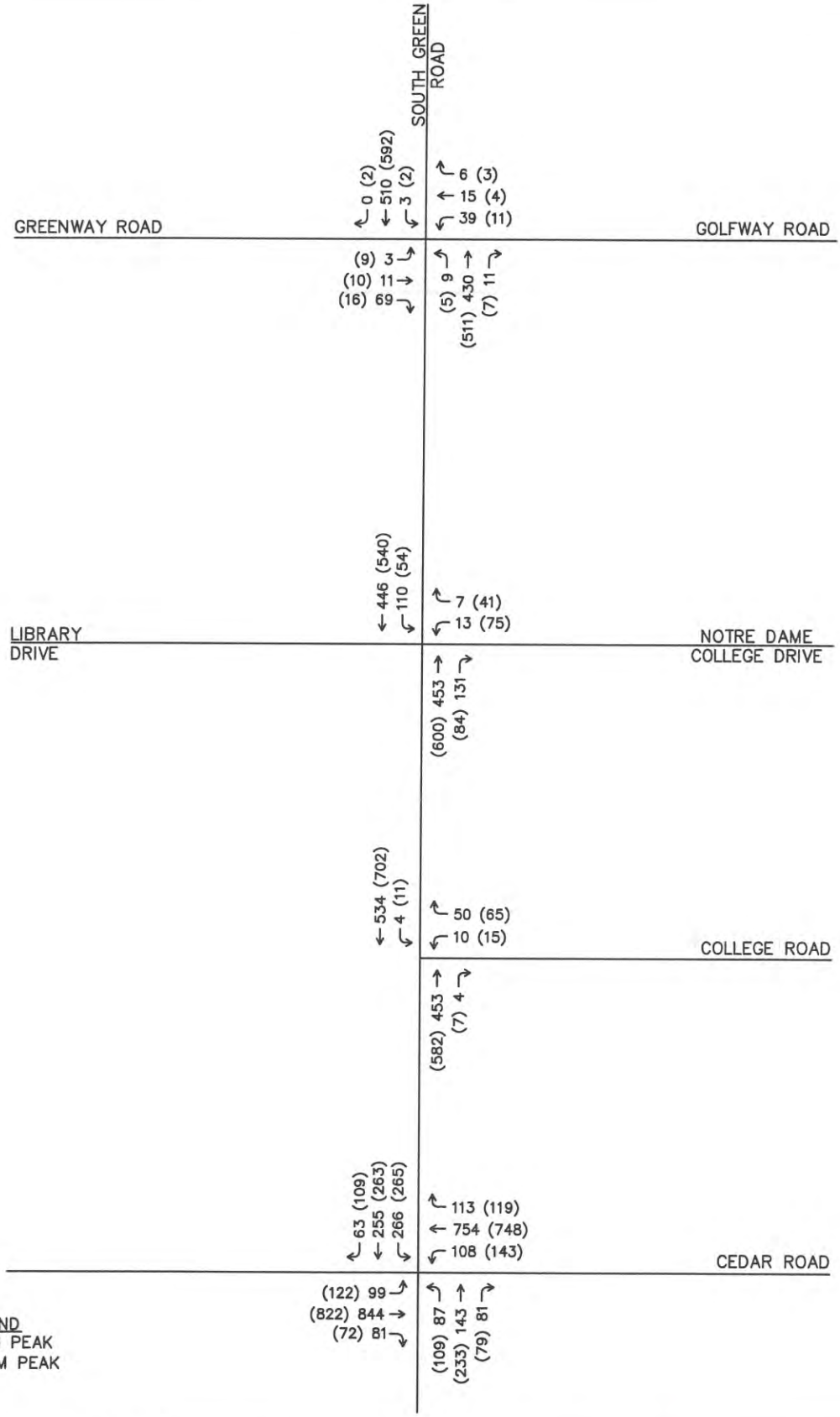

N.T.S.

FIGURE 5

OPENING YEAR 2013
'NO–BUILD' TRAFFIC
VOLUMES

JANUARY 2013

GPD GROUP
520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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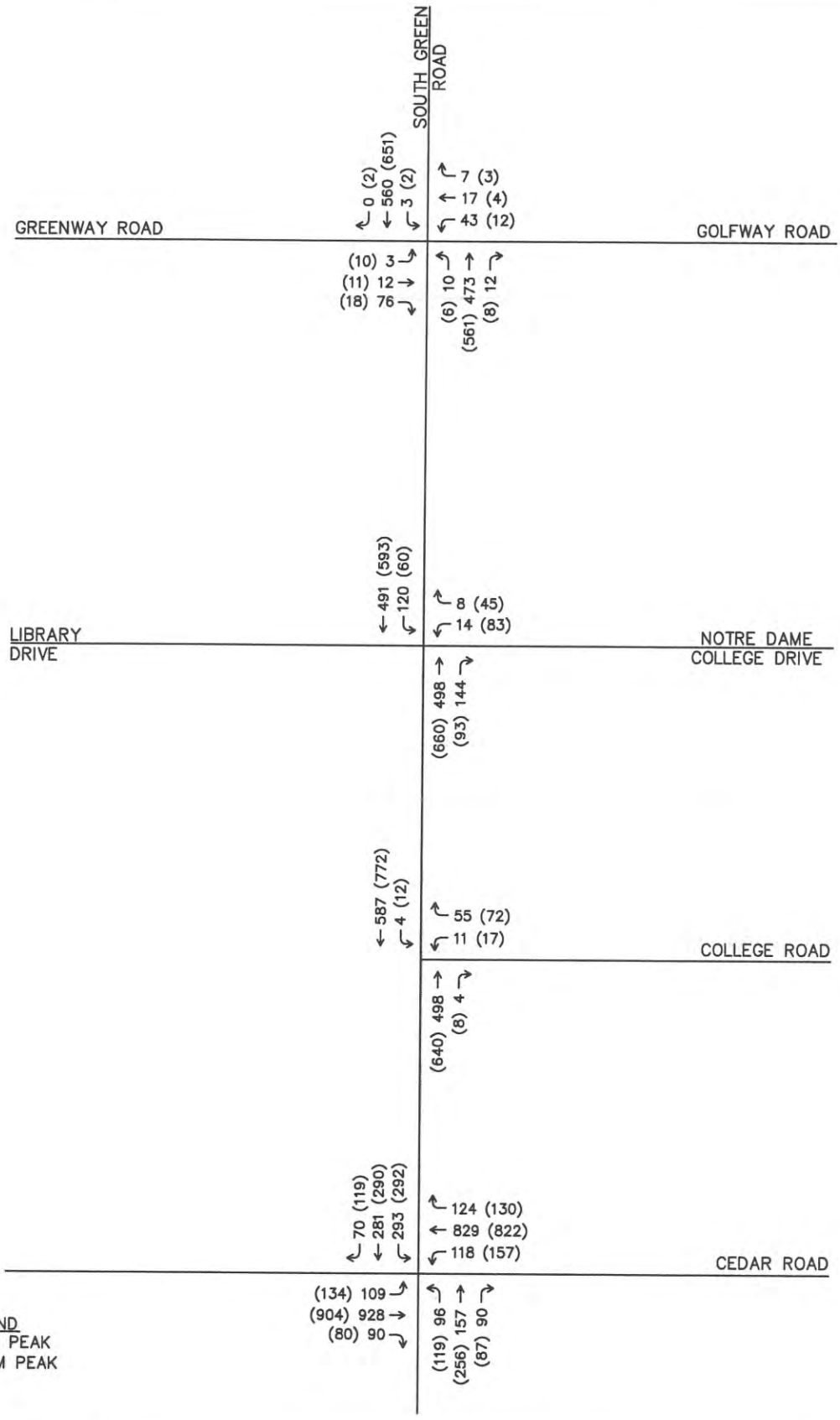

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N.T.S.

FIGURE 6

DESIGN YEAR 2033
'NO–BUILD' TRAFFIC
VOLUMES

JANUARY 2013

GPD GROUP
520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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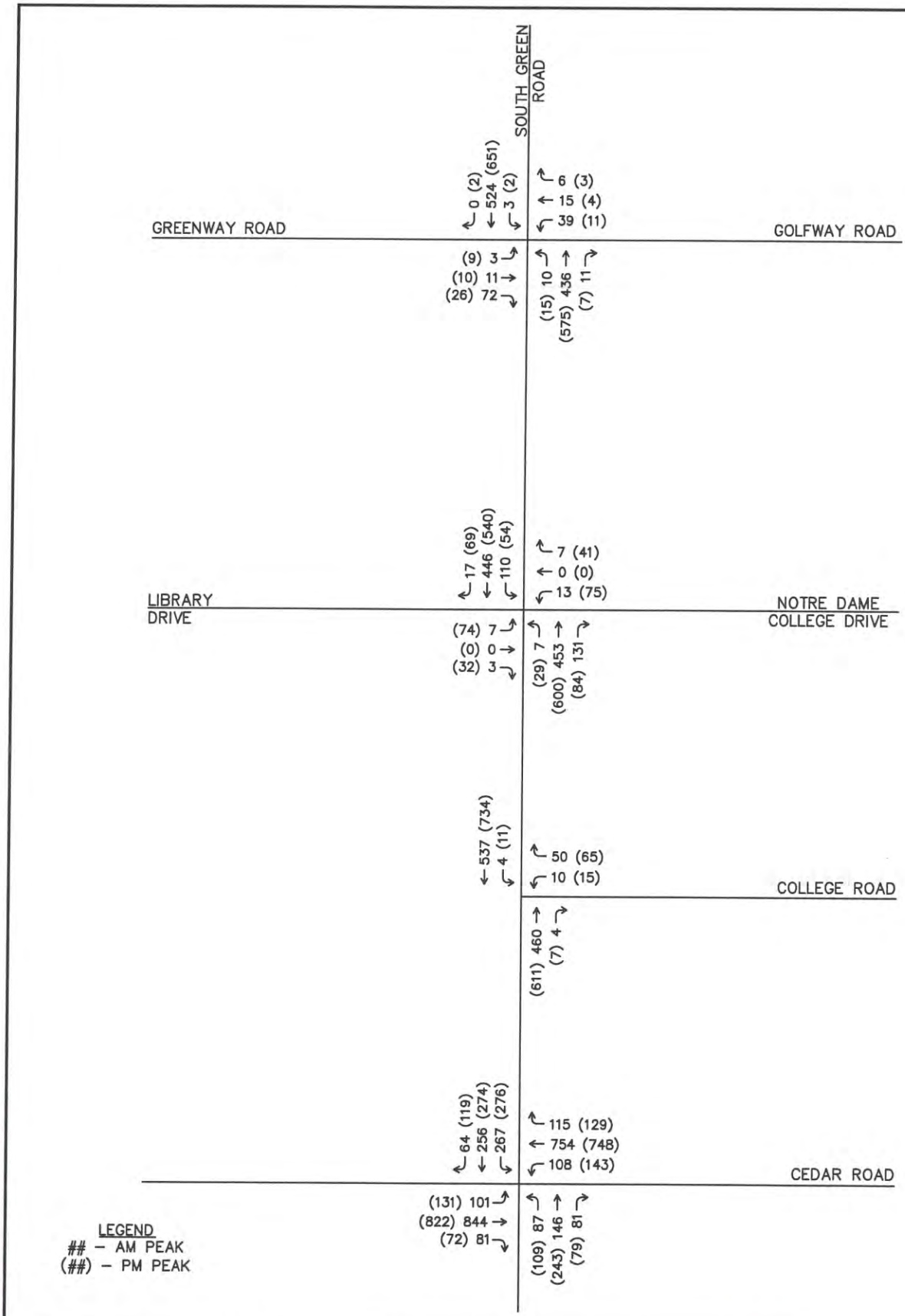

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FIGURE 7

OPENING YEAR 2013
'BUILD' TRAFFIC VOLUMES

JANUARY 2013

GPD GROUP
520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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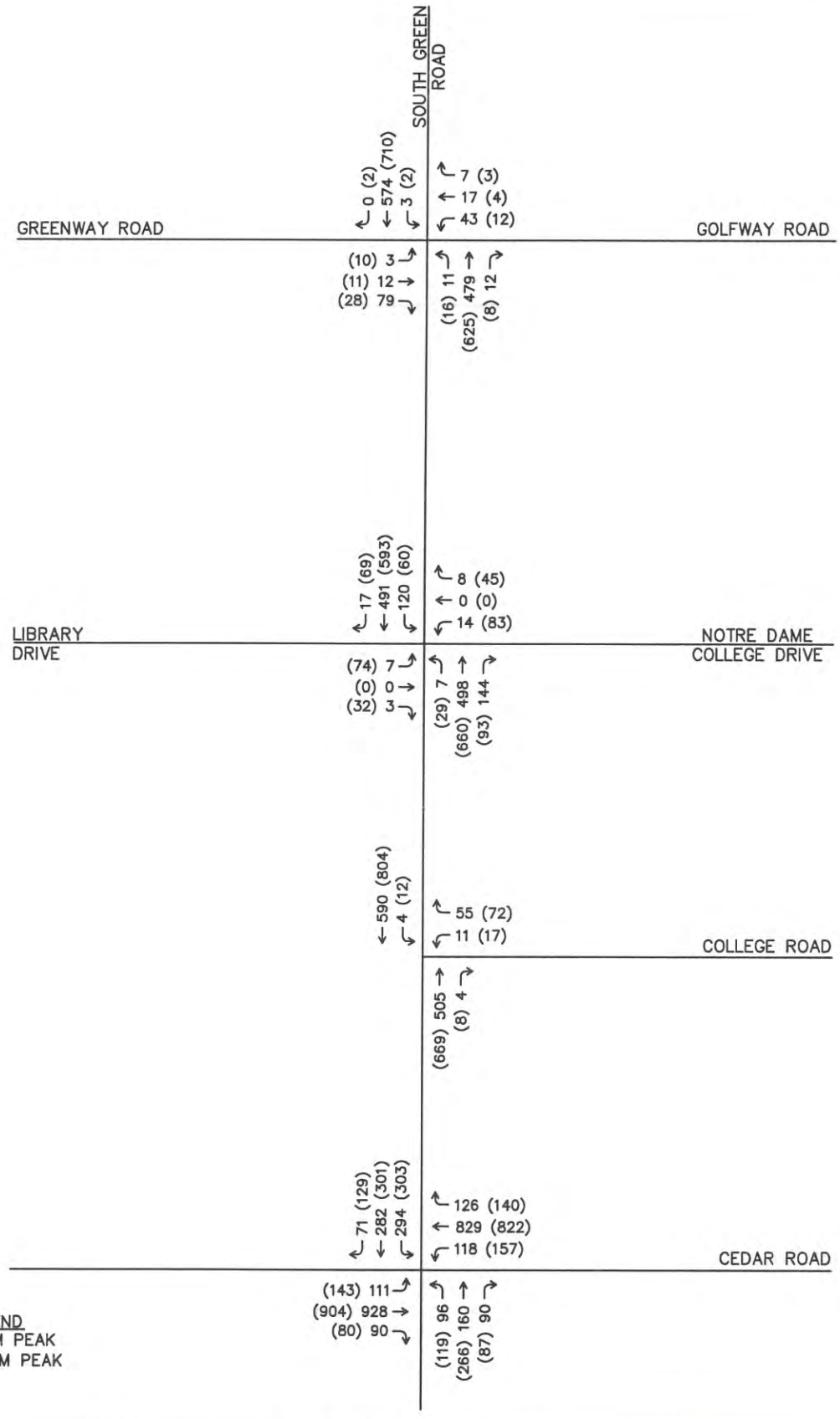

N

N.T.S.

FIGURE 8

DESIGN YEAR 2033
'BUILD' TRAFFIC VOLUMES

JANUARY 2013

GPD GROUP
520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

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FIGURE 9

POTENTIAL NOTRE DAME COLLEGE
SITE RECONFIGURATION

JANUARY 2013

N

N.T.S.

GPD GROUP

520 South Main Street, Suite 2531, Akron,Ohio 44311
330-572-2100 Fax 330-572-2101

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APPENDIX A
SITE PHOTO LOG

Looking north on South Green Road towards
the Cedar Road Intersection

Looking South on South Green Road towards
the Cedar Road Intersection

Looking east on Cedar Road towards
the South Green Road Intersection

Looking west on Cedar Road towards
the South Green Road Intersection

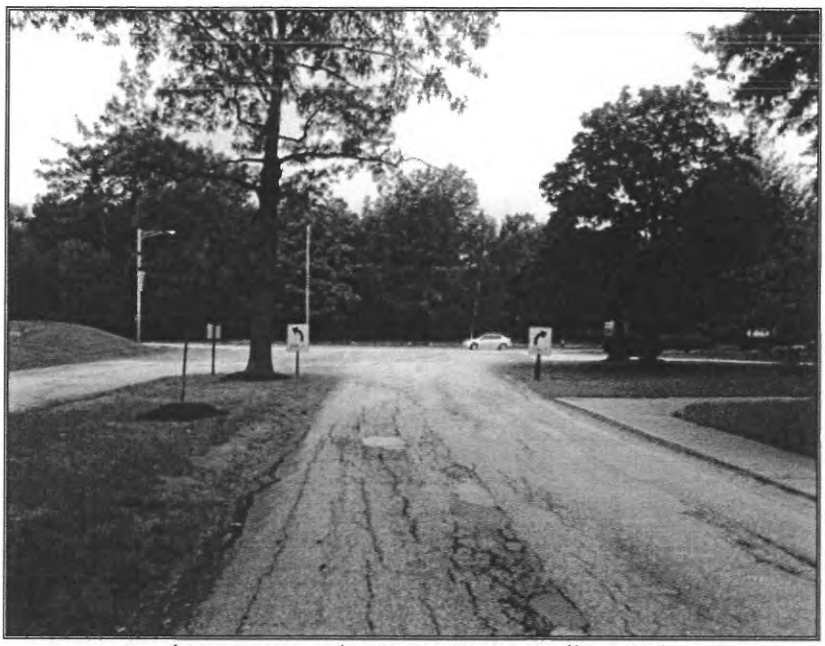
Looking north on South Green Road towards
the College Road Intersection

Looking south on South Green Road towards
the College Road Intersection

Looking west on College Road towards
the South Green Road Intersection

Looking north on South Green Road towards
the Notre Dame College Drive Intersection

Looking south on South Green Road towards
the Notre Dame College Drive Intersection



Looking west on the Notre Dame College Drive
towards the South Green Intersection

Looking north on South Green Road towards
the Greenway Road / Golfway Road Intersection

Looking south on South Green Road towards
the Greenway Road / Golfway Road Intersection

Looking east on Greenway Road towards
the South Green Road Intersection

Looking west on Golfway Road towards
the South Green Road Intersection

APPENDIX B
TURNING MOVEMENT COUNTS

GPD Group

520 South Main Street, Suite 2531
Akron, Ohio 44311
Telephone: (330) 572-2100

South Green Road / Greenway Road / Golfway Road Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Greenway 083012
Site Code : 66032154
Start Date : 8/30/2012
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Greenway Road Eastbound					Golfway Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	14	0	14	7	2	1	0	10	1	59	1	1	62	0	80	1	0	81	167
07:15 AM	1	2	10	0	13	8	1	6	2	17	1	78	1	0	80	0	108	0	1	109	219
07:30 AM	2	5	15	1	23	10	3	0	0	13	2	83	1	0	86	2	136	1	0	139	261
07:45 AM	0	3	22	3	28	9	6	2	0	17	1	121	5	0	127	0	112	0	0	112	284
Total	3	10	61	4	78	34	12	9	2	57	5	341	8	1	355	2	436	2	1	441	931
08:00 AM	1	2	14	0	17	11	2	0	0	13	3	111	0	0	114	1	133	0	1	135	279
08:15 AM	1	0	20	3	24	13	6	4	0	23	3	88	4	3	98	1	136	0	1	138	283
08:30 AM	1	6	13	0	20	6	1	0	0	7	2	108	2	2	114	1	126	0	0	127	268
08:45 AM	2	3	11	0	16	4	1	4	0	9	2	114	6	2	124	0	99	0	1	100	249
Total	5	11	58	3	77	34	10	8	0	52	10	421	12	7	450	3	494	0	3	500	1079
09:00 AM	1	1	6	2	10	2	2	1	0	5	0	82	2	1	85	3	112	0	0	115	215
09:15 AM	1	1	4	2	8	3	0	1	1	5	1	95	5	1	102	0	126	0	0	126	241
09:30 AM	1	1	8	1	11	3	2	0	2	7	1	68	1	2	72	0	104	1	3	108	198
09:45 AM	3	1	15	0	19	3	0	0	3	6	2	94	0	0	96	0	136	0	0	136	257
Total	6	4	33	5	48	11	4	2	6	23	4	339	8	4	355	3	478	1	3	485	911
10:00 AM	1	1	4	0	6	5	1	0	0	6	2	78	1	1	82	0	117	0	0	117	211
10:15 AM	0	0	8	0	8	4	1	2	0	7	1	79	2	0	82	1	107	0	0	108	205
10:30 AM	3	1	7	1	12	0	0	1	0	1	1	70	0	0	71	0	114	0	0	114	198
10:45 AM	0	1	9	0	10	8	0	0	0	8	1	83	1	0	85	0	121	0	0	121	224
Total	4	3	28	1	36	17	2	3	0	22	5	310	4	1	320	1	459	0	0	460	838
11:00 AM	0	1	7	0	8	1	0	2	0	3	2	93	1	0	96	1	112	0	0	113	220
11:15 AM	0	0	8	1	9	6	1	1	0	8	6	102	2	1	111	0	155	0	0	155	283
11:30 AM	3	1	4	1	9	1	1	1	0	3	0	94	1	0	95	0	121	1	0	122	229
11:45 AM	1	0	3	0	4	0	0	0	1	1	0	109	1	0	110	0	150	0	0	150	265
Total	4	2	22	2	30	8	2	4	1	15	8	398	5	1	412	1	538	1	0	540	997
12:00 PM	1	0	2	0	3	4	0	1	1	6	0	103	1	1	105	2	140	0	0	142	256
12:15 PM	1	0	3	1	5	4	1	0	0	5	4	136	2	0	142	0	133	0	2	135	287
12:30 PM	1	1	4	0	6	4	1	4	0	9	2	111	0	1	114	1	123	1	0	125	254
12:45 PM	1	0	6	0	7	2	0	2	0	4	5	81	1	1	88	0	154	1	0	155	254
Total	4	1	15	1	21	14	2	7	1	24	11	431	4	3	449	3	550	2	2	557	1051
01:00 PM	0	1	5	0	6	4	0	0	0	4	1	88	2	1	92	0	128	0	1	129	231
01:15 PM	1	1	1	0	3	0	1	0	0	1	2	90	0	0	92	1	110	0	0	111	207
01:30 PM	1	0	3	0	4	4	0	0	0	4	2	74	0	0	76	1	150	0	0	151	235
01:45 PM	0	2	4	0	6	2	1	1	1	5	0	69	0	0	69	0	144	0	0	144	224
Total	2	4	13	0	19	10	2	1	1	14	5	321	2	1	329	2	532	0	1	535	897
02:00 PM	1	2	4	0	7	3	1	0	1	5	1	74	1	0	76	0	134	0	0	134	222
02:15 PM	0	3	5	0	8	4	1	1	0	6	0	81	0	0	81	0	126	0	0	126	221
02:30 PM	2	2	3	0	7	5	2	0	1	8	1	89	1	0	91	0	118	0	0	118	224
02:45 PM	1	1	2	0	4	3	1	1	0	5	0	96	0	0	96	0	109	0	0	109	214
Total	4	8	14	0	26	15	5	2	2	24	2	340	2	0	344	0	487	0	0	487	881
03:00 PM	2	2	4	0	8	5	2	0	1	8	1	102	1	3	107	0	101	0	2	103	226
03:15 PM	2	5	3	0	10	4	0	0	1	5	0	110	6	1	117	1	125	0	0	126	258

GPD GROUP

GPD Group

520 South Main Street, Suite 2531
Akron, Ohio 44311
Telephone: (330) 572-2100

South Green Road / Greenway Road / Golfway Road Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Greenway 083012
Site Code : 66032154
Start Date : 8/30/2012
Page No : 2

Groups Printed- Passenger Vehicles - Trucks - Buses

	Greenway Road Eastbound					Golfway Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	2	4	3	0	9	3	0	0	0	3	3	91	0	1	95	2	133	0	0	135	242
03:45 PM	0	1	5	0	6	9	0	2	0	11	3	129	1	2	135	0	171	0	0	171	323
Total	6	12	15	0	33	21	2	2	2	27	7	432	8	7	454	3	530	0	2	535	1049
04:00 PM	1	0	2	5	8	3	0	2	1	6	1	115	1	0	117	0	134	0	0	134	265
04:15 PM	1	3	4	0	8	2	0	0	2	4	2	124	1	1	128	1	147	0	0	148	288
04:30 PM	0	0	0	0	0	0	0	1	2	3	1	135	1	0	137	1	126	0	0	127	267
04:45 PM	1	3	5	0	9	3	1	0	1	5	1	110	0	0	111	0	144	0	0	144	269
Total	3	6	11	5	25	8	1	3	6	18	5	484	3	1	493	2	551	0	0	553	1089
05:00 PM	4	4	4	0	12	4	2	0	2	8	1	127	3	0	131	0	165	2	0	167	318
05:15 PM	4	3	7	0	14	4	1	2	1	8	2	136	3	0	141	1	154	0	0	155	318
05:30 PM	1	2	2	0	5	3	1	0	3	7	4	105	3	0	112	0	131	0	0	131	255
05:45 PM	2	4	6	0	12	6	0	0	1	7	1	104	1	0	106	0	126	0	0	126	251
Total	11	13	19	0	43	17	4	2	7	30	8	472	10	0	490	1	576	2	0	579	1142
06:00 PM	1	1	2	0	4	4	0	2	1	7	0	83	4	0	87	1	113	0	0	114	212
06:15 PM	2	1	4	0	7	3	0	0	2	5	0	97	1	0	98	0	93	0	0	93	203
06:30 PM	0	0	4	0	4	4	0	2	0	6	0	111	1	0	112	1	115	0	0	116	238
06:45 PM	1	0	3	0	4	1	2	0	0	3	0	77	1	0	78	2	105	1	0	108	193
Total	4	2	13	0	19	12	2	4	3	21	0	368	7	0	375	4	426	1	0	431	846
Grand Total	56	76	302	21	455	201	48	47	31	327	70	4657	73	26	4826	25	6057	9	12	6103	11711
Apprch %	12.3	16.7	66.4	4.6		61.5	14.7	14.4	9.5		1.5	96.5	1.5	0.5		0.4	99.2	0.1	0.2		
Total %	0.5	0.6	2.6	0.2	3.9	1.7	0.4	0.4	0.3	2.8	0.6	39.8	0.6	0.2	41.2	0.2	51.7	0.1	0.1	52.1	
Passenger Vehicles	53	70	300	21	444	197	46	45	31	319	70	4576	73	26	4745	22	5982	9	12	6025	11533
% Passenger Vehicles	94.6	92.1	99.3	100	97.6	98	95.8	95.7	100	97.6	100	98.3	100	100	98.3	88	98.8	100	100	98.7	98.5
Trucks	0	0	1	0	1	2	1	2	0	5	0	54	0	0	54	0	53	0	0	53	113
% Trucks	0	0	0.3	0	0.2	1	2.1	4.3	0	1.5	0	1.2	0	0	1.1	0	0.9	0	0	0.9	1
Buses	3	6	1	0	10	2	1	0	0	3	0	27	0	0	27	3	22	0	0	25	65
% Buses	5.4	7.9	0.3	0	2.2	1	2.1	0	0	0.9	0	0.6	0	0	0.6	12	0.4	0	0	0.4	0.6

GPD Group
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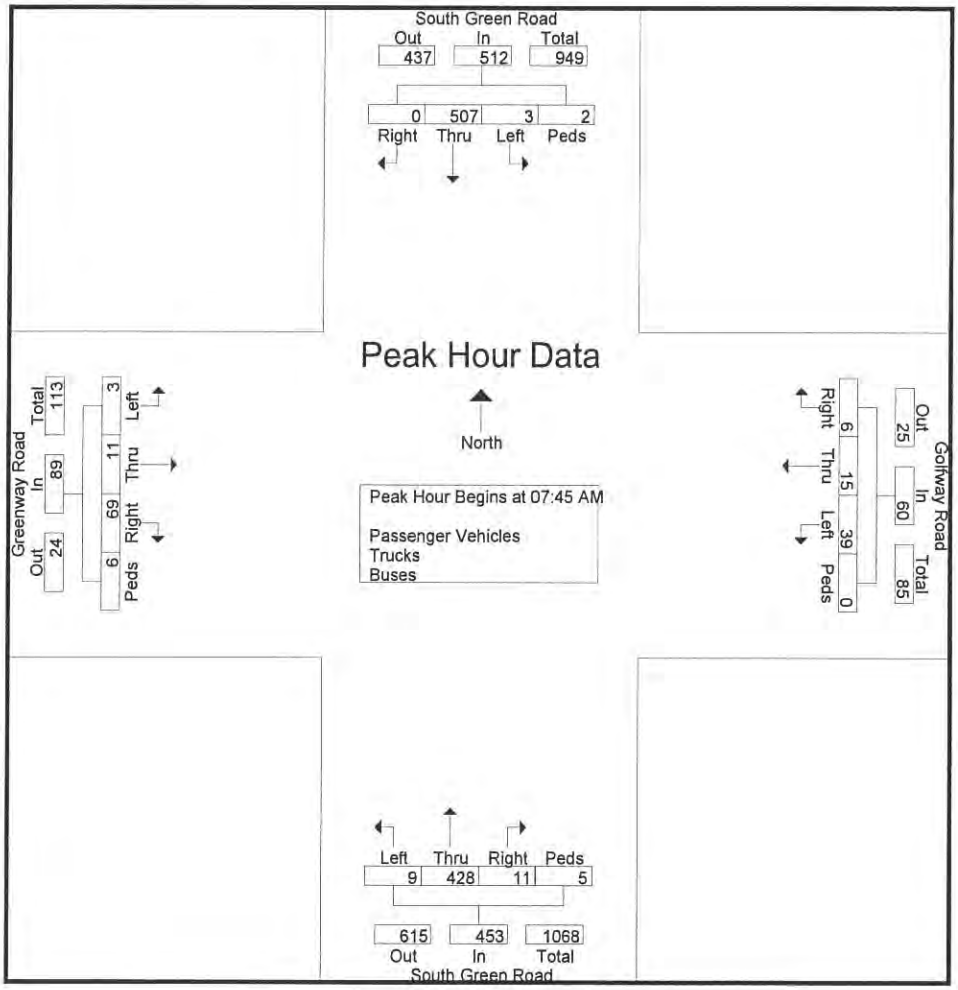
Telephone: (330) 572-2100

South Green Road / Greenway Road / Golfway Road Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Greenway 083012
Site Code : 66032154
Start Date : 8/30/2012
Page No : 3

	Greenway Road Eastbound					Golfway Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	3	**22**	**3**	**28**	9	**6**	2	0	17	1	**121**	**5**	0	**127**	0	112	0	0	112	**284**
08:00 AM	**1**	2	14	0	17	11	2	0	0	13	**3**	111	0	0	114	**1**	133	0	**1**	135	279
08:15 AM	1	0	20	3	24	**13**	6	**4**	0	**23**	3	88	4	**3**	98	1	**136**	0	1	**138**	283
08:30 AM	1	**6**	13	0	20	6	1	0	0	7	2	108	2	2	114	1	126	0	0	127	268
Total Volume	3	11	69	6	89	39	15	6	0	60	9	428	11	5	453	3	507	0	2	512	1114
% App. Total	3.4	12.4	77.5	6.7		65	25	10	0		2	94.5	2.4	1.1		0.6	99	0	0.4		
PHF	.750	.458	.784	.500	.795	.750	.625	.375	.000	.652	.750	.884	.550	.417	.892	.750	.932	.000	.500	.928	.981



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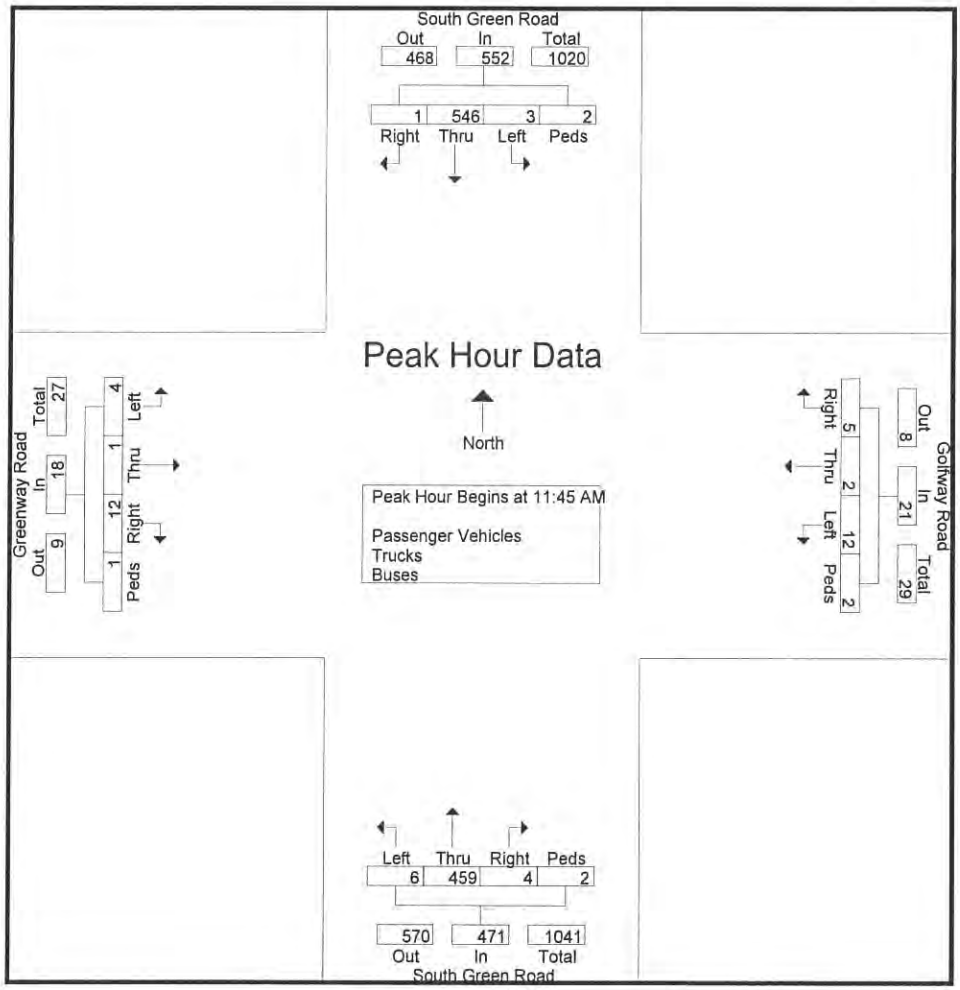
South Green Road / Greenway Road / Golfway Road Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Greenway 083012
Site Code : 66032154
Start Date : 8/30/2012
Page No : 4

	Greenway Road Eastbound					Golfway Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	1	0	3	0	4	0	0	0	1	1	0	109	1	0	110	0	**150**	0	0	**150**	265
12:00 PM	1	0	2	0	3	**4**	0	1	1	6	0	103	1	1	105	**2**	140	0	0	142	256
12:15 PM	1	0	3	1	5	4	1	0	0	5	4	**136**	**2**	0	**142**	0	133	0	**2**	135	**287**
12:30 PM	1	1	**4**	0	**6**	4	1	**4**	0	**9**	2	111	0	1	114	1	123	1	0	125	254
Total Volume	4	1	12	1	18	12	2	5	2	21	6	459	4	2	471	3	546	1	2	552	1062
% App. Total	22.2	5.6	66.7	5.6		57.1	9.5	23.8	9.5		1.3	97.5	0.8	0.4		0.5	98.9	0.2	0.4		
PHF	1.000	.250	.750	.250	.750	.750	.500	.313	.500	.583	.375	.844	.500	.500	.829	.375	.910	.250	.250	.920	.925



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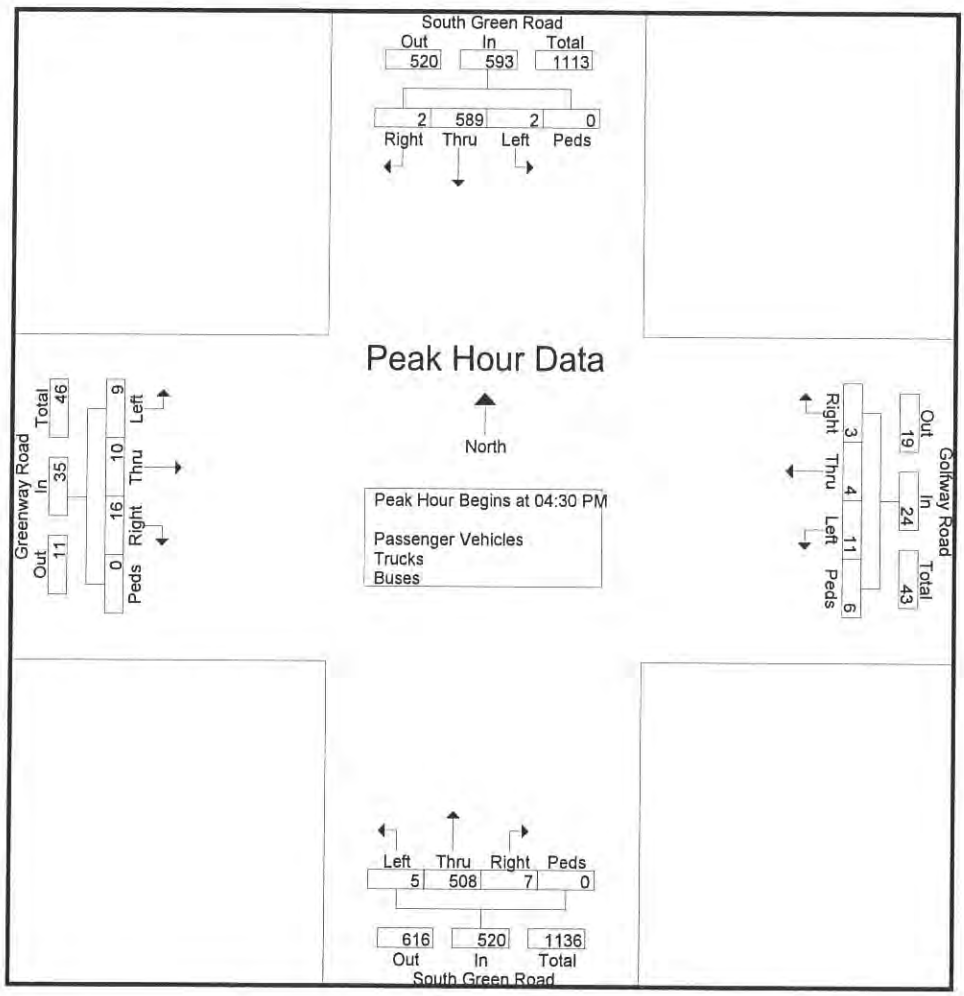
South Green Road / Greenway Road / Golfway Road Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Greenway 083012
Site Code : 66032154
Start Date : 8/30/2012
Page No : 5

	Greenway Road Eastbound					Golfway Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	1	**2**	3	1	135	1	0	137	**1**	126	0	0	127	267
04:45 PM	1	3	5	0	9	3	1	0	1	5	1	110	0	0	111	0	144	0	0	144	269
05:00 PM	**4**	**4**	4	0	12	**4**	**2**	0	2	**8**	1	127	**3**	0	131	0	**165**	**2**	0	**167**	**318**
05:15 PM	4	3	**7**	0	**14**	4	1	**2**	1	8	**2**	**136**	3	0	**141**	1	154	0	0	155	318
Total Volume	9	10	16	0	35	11	4	3	6	24	5	508	7	0	520	2	589	2	0	593	1172
% App. Total	25.7	28.6	45.7	0		45.8	16.7	12.5	25		1	97.7	1.3	0		0.3	99.3	0.3	0		
PHF	.563	.625	.571	.000	.625	.688	.500	.375	.750	.750	.625	.934	.583	.000	.922	.500	.892	.250	.000	.888	.921



GPD GROUP

GPD Group

520 South Main Street, Suite 2531
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South Green Road / Notre Dame College Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and ND College 083012
Site Code : 74042154
Start Date : 8/30/2012
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Eastbound					Notre Dame College Drive Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	1	0	1	0	2	5	1	3	0	9	0	59	3	1	63	4	89	0	1	94	168
07:15 AM	0	0	0	1	1	1	0	0	0	1	0	85	3	0	88	3	110	0	0	113	203
07:30 AM	0	0	0	1	1	2	0	0	0	2	0	88	13	0	101	6	146	0	0	152	256
07:45 AM	1	0	0	0	1	0	0	1	0	1	0	121	15	0	136	13	118	0	0	131	269
Total	2	0	1	2	5	8	1	4	0	13	0	353	34	1	388	26	463	0	1	490	896
08:00 AM	0	0	0	0	0	7	0	3	0	10	0	117	35	0	152	27	118	0	1	146	308
08:15 AM	0	0	0	0	0	4	0	1	0	5	0	102	53	1	156	49	96	0	1	146	307
08:30 AM	0	0	0	0	0	2	0	2	0	4	0	111	27	2	140	20	112	0	0	132	276
08:45 AM	0	0	0	0	0	4	0	4	1	9	0	115	21	2	138	8	104	0	2	114	261
Total	0	0	0	0	0	17	0	10	1	28	0	445	136	5	586	104	430	0	4	538	1152
09:00 AM	0	0	0	1	1	4	0	1	0	5	0	94	17	1	112	8	101	0	1	110	228
09:15 AM	0	0	0	0	0	5	0	3	0	8	0	98	26	0	124	12	108	0	0	120	252
09:30 AM	0	0	0	1	1	2	0	0	1	3	0	72	36	1	109	16	87	0	1	104	217
09:45 AM	1	0	0	1	2	15	0	4	0	19	0	105	48	1	154	41	94	0	0	135	310
Total	1	0	0	3	4	26	0	8	1	35	0	369	127	3	499	77	390	0	2	469	1007
10:00 AM	0	0	0	0	0	14	0	8	1	23	0	97	44	1	142	36	93	0	0	129	294
10:15 AM	0	0	0	0	0	13	0	10	0	23	0	93	41	0	134	30	94	0	0	124	281
10:30 AM	0	0	0	0	0	12	0	13	2	27	0	89	36	1	126	25	96	0	0	121	274
10:45 AM	0	0	0	0	0	14	0	15	0	29	0	85	31	0	116	22	95	0	0	117	262
Total	0	0	0	0	0	53	0	46	3	102	0	364	152	2	518	113	378	0	0	491	1111
11:00 AM	0	0	0	0	0	11	0	17	0	28	0	82	26	1	109	19	97	0	1	117	254
11:15 AM	1	0	1	0	2	25	0	13	2	40	0	102	56	4	162	28	98	0	0	126	330
11:30 AM	0	0	0	0	0	13	0	12	0	25	0	96	14	2	112	11	105	0	0	116	253
11:45 AM	0	0	0	4	4	8	0	4	0	12	0	100	17	0	117	11	115	0	0	126	259
Total	1	0	1	4	6	57	0	46	2	105	0	380	113	7	500	69	415	0	1	485	1096
12:00 PM	0	0	0	0	0	12	0	5	0	17	0	119	7	0	126	5	123	0	0	128	271
12:15 PM	0	0	0	0	0	14	0	7	0	21	0	110	18	2	130	10	107	1	1	119	270
12:30 PM	0	0	0	0	0	29	0	17	0	46	0	103	30	0	133	8	100	0	0	108	287
12:45 PM	0	0	0	1	1	14	0	7	2	23	0	108	31	2	141	33	108	0	0	141	306
Total	0	0	0	1	1	69	0	36	2	107	0	440	86	4	530	56	438	1	1	496	1134
01:00 PM	1	0	0	0	1	11	0	5	1	17	0	108	14	0	122	11	97	0	1	109	249
01:15 PM	0	0	0	0	0	3	0	9	1	13	0	135	12	0	147	6	90	0	1	97	257
01:30 PM	0	0	0	0	0	15	0	7	1	23	0	107	29	0	136	6	110	0	0	116	275
01:45 PM	0	0	0	0	0	16	0	10	1	27	0	107	16	0	123	12	118	0	0	130	280
Total	1	0	0	0	1	45	0	31	4	80	0	457	71	0	528	35	415	0	2	452	1061
02:00 PM	0	0	0	0	0	15	0	9	0	24	0	111	15	1	127	13	113	0	0	126	277
02:15 PM	0	0	0	0	0	13	0	8	0	21	0	117	16	0	133	14	110	0	0	124	278
02:30 PM	0	0	0	0	0	12	0	7	0	19	0	123	17	1	141	15	107	0	0	122	282
02:45 PM	0	0	0	0	0	11	0	5	0	16	0	131	15	0	146	16	105	0	0	121	283
Total	0	0	0	0	0	51	0	29	0	80	0	482	63	2	547	58	435	0	0	493	1120
03:00 PM	0	0	0	2	2	10	0	6	0	16	0	140	15	0	155	15	104	0	0	119	292

GPD GROUP

GPD Group

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South Green Road / Notre Dame College Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and ND College 083012
Site Code : 74042154
Start Date : 8/30/2012
Page No : 2

Groups Printed- Passenger Vehicles - Trucks - Buses

	Eastbound					Notre Dame College Drive Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:15 PM	0	0	0	0	0	10	0	5	1	16	0	132	11	0	143	15	119	0	2	136	295
03:30 PM	0	0	0	0	0	13	0	6	0	19	0	145	14	0	159	14	132	0	0	146	324
03:45 PM	0	0	0	0	0	31	0	21	7	59	0	172	27	0	199	13	162	0	0	175	433
Total	0	0	0	2	2	64	0	38	8	110	0	589	67	0	656	57	517	0	2	576	1344
04:00 PM	0	0	0	0	0	23	0	5	0	28	0	137	21	0	158	12	120	0	0	132	318
04:15 PM	0	0	0	0	0	8	0	9	0	17	0	143	22	0	165	15	123	0	0	138	320
04:30 PM	0	0	0	0	0	8	0	16	0	24	0	148	9	0	157	8	116	0	0	124	305
04:45 PM	0	0	0	0	0	24	0	10	1	35	0	107	21	0	128	7	141	0	2	150	313
Total	0	0	0	0	0	63	0	40	1	104	0	535	73	0	608	42	500	0	2	544	1256
05:00 PM	0	0	0	0	0	14	0	17	1	32	0	133	15	0	148	8	167	0	0	175	355
05:15 PM	0	0	0	0	0	12	0	8	1	21	0	163	19	1	183	4	130	0	1	135	339
05:30 PM	0	0	0	0	0	15	0	10	0	25	0	147	17	1	165	7	134	0	0	141	331
05:45 PM	0	0	0	0	0	14	0	13	0	27	0	121	21	0	142	12	124	0	0	136	305
Total	0	0	0	0	0	55	0	48	2	105	0	564	72	2	638	31	555	0	1	587	1330
06:00 PM	0	0	1	0	1	11	0	9	0	20	0	119	19	1	139	7	119	0	2	128	288
06:15 PM	0	0	0	0	0	17	0	17	0	34	0	150	17	0	167	8	100	0	0	108	309
06:30 PM	0	0	0	0	0	6	0	10	0	16	0	139	25	2	166	10	113	0	1	124	306
06:45 PM	0	0	0	0	0	18	0	12	0	30	0	124	19	2	145	13	94	0	3	110	285
Total	0	0	1	0	1	52	0	48	0	100	0	532	80	5	617	38	426	0	6	470	1188
Grand Total	5	0	3	12	20	560	1	384	24	969	0	5510	1074	31	6615	706	5362	1	22	6091	13695
Apprch %	25	0	15	60		57.8	0.1	39.6	2.5		0	83.3	16.2	0.5		11.6	88	0	0.4		
Total %	0	0	0	0.1	0.1	4.1	0	2.8	0.2	7.1	0	40.2	7.8	0.2	48.3	5.2	39.2	0	0.2	44.5	
Passenger Vehicles	5	0	3	12	20	556	0	381	24	961	0	5420	1061	31	6512	703	5277	0	22	6002	13495
% Passenger Vehicles	100	0	100	100	100	99.3	0	99.2	100	99.2	0	98.4	98.8	100	98.4	99.6	98.4	0	100	98.5	98.5
Trucks	0	0	0	0	0	4	1	1	0	6	0	61	8	0	69	2	60	1	0	63	138
% Trucks	0	0	0	0	0	0.7	100	0.3	0	0.6	0	1.1	0.7	0	1	0.3	1.1	100	0	1	1
Buses	0	0	0	0	0	0	0	2	0	2	0	29	5	0	34	1	25	0	0	26	62
% Buses	0	0	0	0	0	0	0	0.5	0	0.2	0	0.5	0.5	0	0.5	0.1	0.5	0	0	0.4	0.5

GPD Group

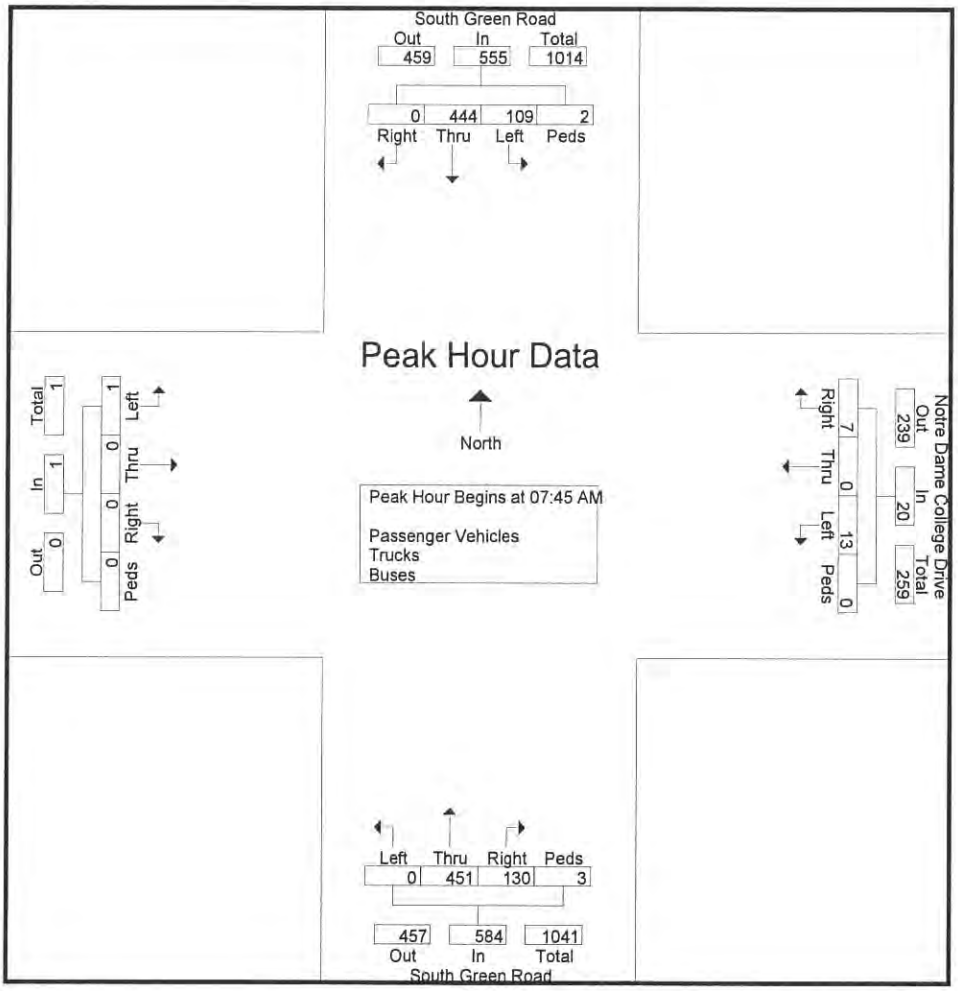
520 South Main Street, Suite 2531
Akron, Ohio 44311
Telephone: (330) 572-2100

South Green Road / Notre Dame College Drive Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and ND College 083012
Site Code : 74042154
Start Date : 8/30/2012
Page No : 3

	Eastbound					Notre Dame College Drive Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	**1**	0	0	0	**1**	0	0	1	0	1	0	**121**	15	0	136	13	**118**	0	0	131	269
08:00 AM	0	0	0	0	0	**7**	0	**3**	0	**10**	0	117	35	0	152	27	118	0	**1**	**146**	**308**
08:15 AM	0	0	0	0	0	4	0	1	0	5	0	102	**53**	1	**156**	**49**	96	0	1	146	307
08:30 AM	0	0	0	0	0	2	0	2	0	4	0	111	27	**2**	140	20	112	0	0	132	276
Total Volume	1	0	0	0	1	13	0	7	0	20	0	451	130	3	584	109	444	0	2	555	1160
% App. Total	100	0	0	0		65	0	35	0		0	77.2	22.3	0.5		19.6	80	0	0.4		
PHF	.250	.000	.000	.000	.250	.464	.000	.583	.000	.500	.000	.932	.613	.375	.936	.556	.941	.000	.500	.950	.942



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Site Code : 74042154
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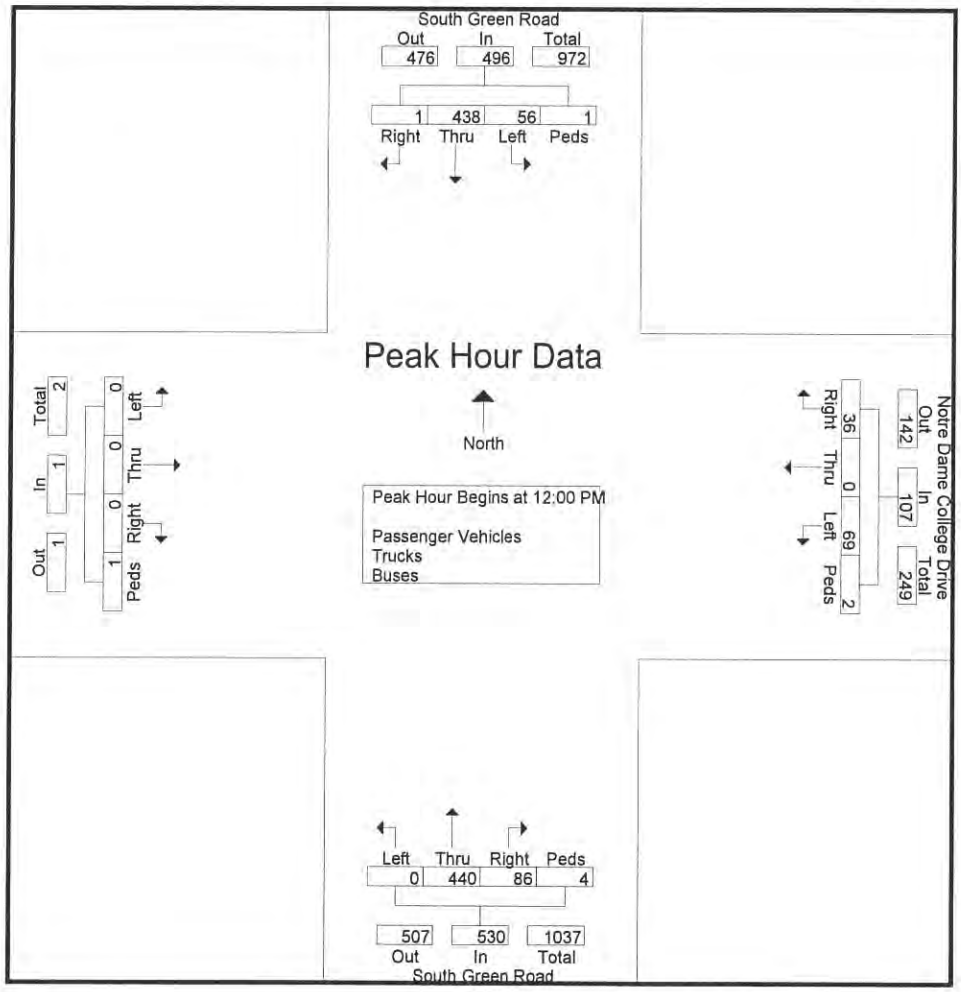
Page No : 4

	Eastbound					Notre Dame College Drive Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	12	0	5	0	17	0	**119**	7	0	126	5	**123**	0	0	128	271
12:15 PM	0	0	0	0	0	14	0	7	0	21	0	110	18	**2**	130	10	107	**1**	**1**	119	270
12:30 PM	0	0	0	0	0	**29**	0	**17**	0	**46**	0	103	30	0	133	8	100	0	0	108	287
12:45 PM	0	0	0	**1**	**1**	14	0	7	**2**	23	0	108	**31**	2	**141**	**33**	108	0	0	**141**	**306**
Total Volume	0	0	0	1	1	69	0	36	2	107	0	440	86	4	530	56	438	1	1	496	1134
% App. Total	0	0	0	100		64.5	0	33.6	1.9		0	83	16.2	0.8		11.3	88.3	0.2	0.2		
PHF	.000	.000	.000	.250	.250	.595	.000	.529	.250	.582	.000	.924	.694	.500	.940	.424	.890	.250	.250	.879	.926



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South Green Road / Notre Dame College Drive Intersection

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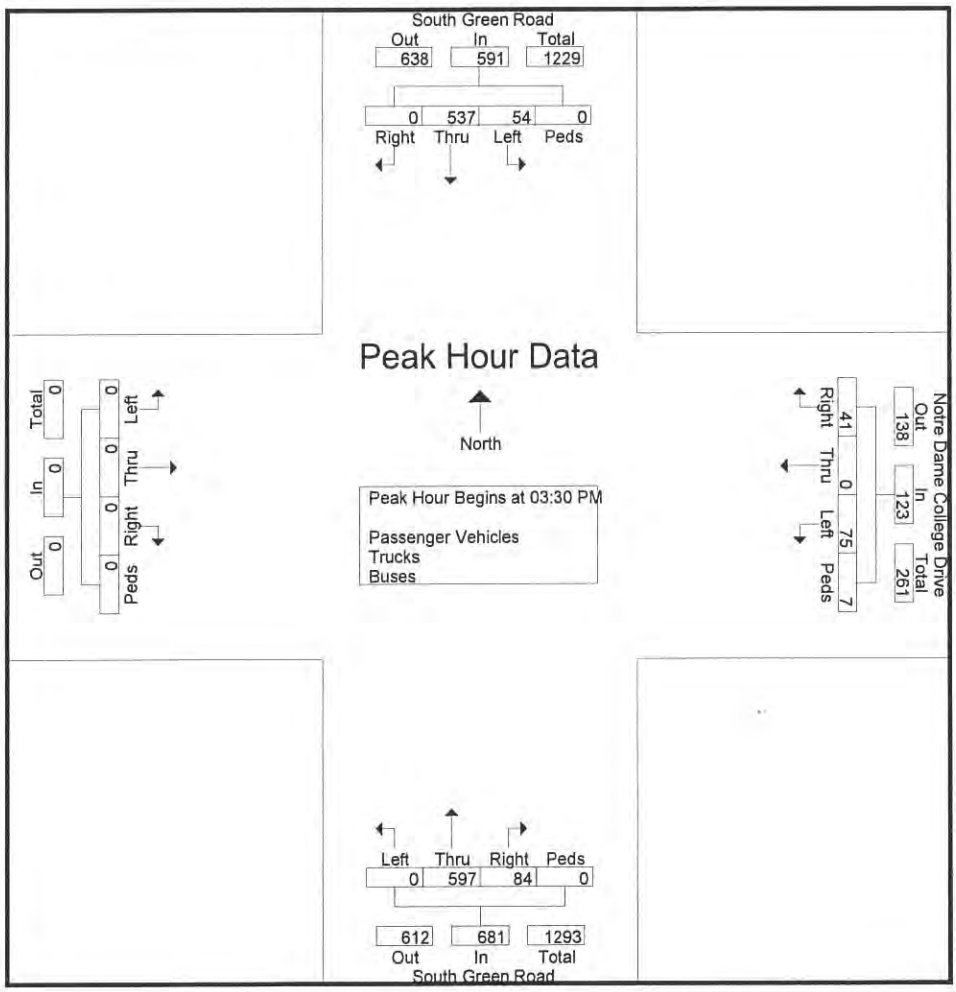
File Name : South Green and ND College 083012
Site Code : 74042154
Start Date : 8/30/2012
Page No : 5

	Eastbound					Notre Dame College Drive Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	0	0	0	0	0	13	0	6	0	19	0	145	14	0	159	14	132	0	0	146	324
03:45 PM	0	0	0	0	0	**31**	0	**21**	**7**	**59**	0	**172**	**27**	0	**199**	13	**162**	0	0	**175**	**433**
04:00 PM	0	0	0	0	0	23	0	5	0	28	0	137	21	0	158	12	120	0	0	132	318
04:15 PM	0	0	0	0	0	8	0	9	0	17	0	143	22	0	165	**15**	123	0	0	138	320
Total Volume	0	0	0	0	0	75	0	41	7	123	0	597	84	0	681	54	537	0	0	591	1395
% App. Total	0	0	0	0		61	0	33.3	5.7		0	87.7	12.3	0		9.1	90.9	0	0		
PHF	.000	.000	.000	.000	.000	.605	.000	.488	.250	.521	.000	.868	.778	.000	.856	.900	.829	.000	.000	.844	.805



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South Green Road / College Road Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and College 082812
Site Code : 66012154
Start Date : 8/28/2012
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Eastbound					College Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	8	0	8	0	58	0	0	58	0	94	0	2	96	162
07:15 AM	0	0	0	0	0	1	0	10	0	11	0	73	0	2	75	1	111	0	0	112	198
07:30 AM	0	0	0	1	1	2	0	6	0	8	0	87	0	0	87	1	149	0	2	152	248
07:45 AM	0	0	0	0	0	5	0	13	0	18	0	93	2	0	95	1	143	0	0	144	257
Total	0	0	0	1	1	8	0	37	0	45	0	311	2	2	315	3	497	0	4	504	865
08:00 AM	0	0	0	0	0	1	0	10	0	11	0	137	1	2	140	0	132	0	0	132	283
08:15 AM	0	0	0	1	1	2	0	21	0	23	0	134	1	3	138	2	107	0	0	109	271
08:30 AM	0	0	0	0	0	2	0	22	0	24	0	109	0	0	109	0	114	0	0	114	247
08:45 AM	0	0	0	0	0	3	0	11	0	14	0	103	3	3	109	3	104	0	0	107	230
Total	0	0	0	1	1	8	0	64	0	72	0	483	5	8	496	5	457	0	0	462	1031
09:00 AM	0	0	0	0	0	3	0	10	0	13	0	107	2	3	112	4	100	0	2	106	231
09:15 AM	0	0	0	1	1	0	0	16	0	16	0	91	6	0	97	1	103	0	1	105	219
09:30 AM	0	0	0	0	0	4	0	15	0	19	0	108	7	6	121	2	97	0	1	100	240
09:45 AM	0	0	0	0	0	5	0	17	0	22	0	146	3	2	151	4	103	0	0	107	280
Total	0	0	0	1	1	12	0	58	0	70	0	452	18	11	481	11	403	0	4	418	970
10:00 AM	0	0	0	0	0	1	0	18	0	19	0	98	0	0	98	1	99	0	0	100	217
10:15 AM	0	0	0	0	0	3	0	6	0	9	0	97	3	0	100	2	104	0	0	106	215
10:30 AM	0	0	0	0	0	3	0	8	0	11	0	102	1	2	105	1	98	0	0	99	215
10:45 AM	0	0	0	1	1	2	0	12	0	14	0	100	13	0	113	0	133	0	0	133	261
Total	0	0	0	1	1	9	0	44	0	53	0	397	17	2	416	4	434	0	0	438	908
11:00 AM	0	0	0	0	0	6	0	10	0	16	0	110	5	2	117	1	123	0	0	124	257
11:15 AM	0	0	0	0	0	8	0	16	2	26	0	123	3	0	126	1	127	0	3	131	283
11:30 AM	0	0	0	0	0	6	0	9	0	15	1	116	1	0	118	3	121	0	3	127	260
11:45 AM	0	0	0	0	0	6	0	9	0	15	0	124	0	0	124	2	124	0	1	127	266
Total	0	0	0	0	0	26	0	44	2	72	1	473	9	2	485	7	495	0	7	509	1066
12:00 PM	0	0	0	0	0	1	0	9	0	10	0	115	2	2	119	1	141	0	0	142	271
12:15 PM	0	0	0	0	0	3	0	10	2	15	0	100	3	1	104	2	124	0	0	126	245
12:30 PM	0	0	0	0	0	1	0	13	0	14	0	114	0	2	116	1	158	0	0	159	289
12:45 PM	0	0	0	0	0	7	0	11	0	18	0	133	1	0	134	0	132	0	0	132	284
Total	0	0	0	0	0	12	0	43	2	57	0	462	6	5	473	4	555	0	0	559	1089
01:00 PM	0	0	0	0	0	8	0	11	0	19	0	128	3	0	131	2	155	0	1	158	308
01:15 PM	0	0	0	2	2	5	0	12	0	17	0	94	0	2	96	1	100	0	0	101	216
01:30 PM	0	0	0	0	0	3	0	6	1	10	0	95	1	0	96	0	136	0	0	136	242
01:45 PM	0	0	0	0	0	4	0	10	1	15	0	115	2	1	118	1	122	0	0	123	256
Total	0	0	0	2	2	20	0	39	2	61	0	432	6	3	441	4	513	0	1	518	1022
02:00 PM	0	0	0	0	0	4	0	11	1	16	0	117	2	1	120	2	121	0	0	123	259
02:15 PM	0	0	0	0	0	3	0	13	1	17	0	118	1	2	121	1	120	0	0	121	259
02:30 PM	0	0	0	0	0	3	0	14	1	18	0	120	2	1	123	2	119	0	0	121	262
02:45 PM	0	0	0	0	0	4	0	15	2	21	0	121	3	1	125	1	118	0	0	119	265
Total	0	0	0	0	0	14	0	53	5	72	0	476	8	5	489	6	478	0	0	484	1045
03:00 PM	0	0	0	0	0	3	0	16	1	20	0	124	4	1	129	2	121	0	0	123	272
03:15 PM	0	0	0	0	0	3	0	16	0	19	0	143	1	0	144	3	186	0	0	189	352

GPD GROUP

GPD Group

520 South Main Street, Suite 2531
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Telephone: (330) 572-2100

South Green Road / College Road Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and College 082812
Site Code : 66012154
Start Date : 8/28/2012
Page No : 2

Groups Printed- Passenger Vehicles - Trucks - Buses

	Eastbound					College Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	0	0	0	0	0	3	1	18	0	22	0	175	1	0	176	4	142	0	0	146	344
03:45 PM	0	0	0	0	0	2	0	12	2	16	0	145	4	3	152	2	206	0	0	208	376
Total	0	0	0	0	0	11	1	62	3	77	0	587	10	4	601	11	655	0	0	666	1344
04:00 PM	0	0	0	0	0	7	0	19	1	27	0	116	1	2	119	2	165	1	0	168	314
04:15 PM	0	0	0	0	0	4	0	13	0	17	0	113	4	2	119	3	146	0	4	153	289
04:30 PM	0	0	0	2	2	4	0	8	0	12	0	141	2	0	143	1	193	0	0	194	351
04:45 PM	0	0	0	0	0	2	0	10	0	12	0	114	6	0	120	1	161	0	0	162	294
Total	0	0	0	2	2	17	0	50	1	68	0	484	13	4	501	7	665	1	4	677	1248
05:00 PM	0	0	0	0	0	3	0	15	0	18	0	136	3	0	139	1	200	0	0	201	358
05:15 PM	0	0	0	0	0	3	0	20	1	24	0	146	3	1	150	1	173	0	0	174	348
05:30 PM	0	0	0	0	0	5	0	16	0	21	0	140	2	1	143	0	140	0	1	141	305
05:45 PM	0	0	0	1	1	6	0	19	1	26	1	133	2	0	136	0	138	0	0	138	301
Total	0	0	0	1	1	17	0	70	2	89	1	555	10	2	568	2	651	0	1	654	1312
06:00 PM	0	0	0	0	0	3	0	6	0	9	0	104	1	0	105	2	171	0	0	173	287
06:15 PM	0	0	0	0	0	2	0	12	0	14	0	85	2	1	88	4	87	0	0	91	193
06:30 PM	0	0	0	0	0	2	0	8	0	10	0	43	0	0	43	0	70	0	2	72	125
06:45 PM	0	0	0	0	0	1	0	7	0	8	0	23	0	0	23	0	41	0	0	41	72
Total	0	0	0	0	0	8	0	33	0	41	0	255	3	1	259	6	369	0	2	377	677
Grand Total	0	0	0	9	9	162	1	597	17	777	2	5367	107	49	5525	70	6172	1	23	6266	12577
Apprch %	0	0	0	100		20.8	0.1	76.8	2.2		0	97.1	1.9	0.9		1.1	98.5	0	0.4		
Total %	0	0	0	0.1	0.1	1.3	0	4.7	0.1	6.2	0	42.7	0.9	0.4	43.9	0.6	49.1	0	0.2	49.8	
Passenger Vehicles	0	0	0	9	9	161	1	593	17	772	2	5304	105	49	5460	67	6101	1	23	6192	12433
% Passenger Vehicles	0	0	0	100	100	99.4	100	99.3	100	99.4	100	98.8	98.1	100	98.8	95.7	98.8	100	100	98.8	98.9
Trucks	0	0	0	0	0	1	0	3	0	4	0	43	2	0	45	3	48	0	0	51	100
% Trucks	0	0	0	0	0	0.6	0	0.5	0	0.5	0	0.8	1.9	0	0.8	4.3	0.8	0	0	0.8	0.8
Buses	0	0	0	0	0	0	0	1	0	1	0	20	0	0	20	0	23	0	0	23	44
% Buses	0	0	0	0	0	0	0	0.2	0	0.1	0	0.4	0	0	0.4	0	0.4	0	0	0.4	0.3

GPD Group

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South Green Road / College Road Intersection

Project Number: 2012154.00
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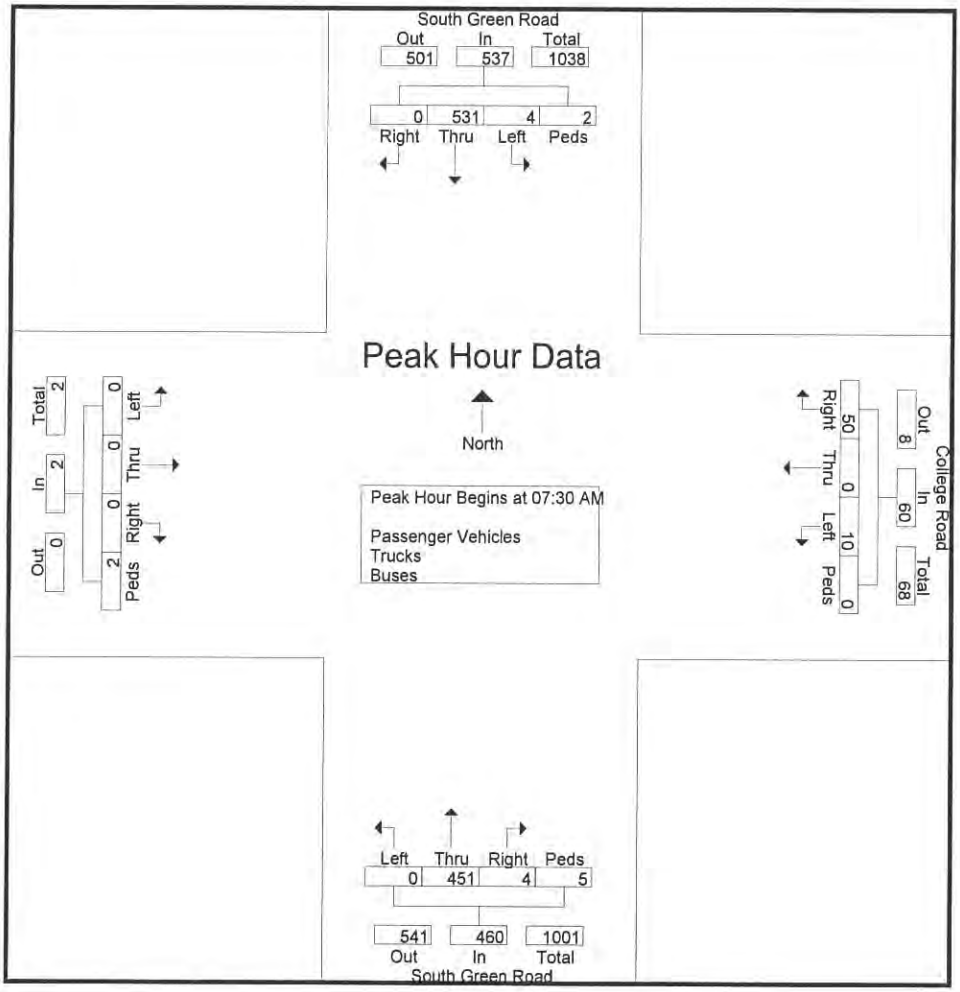
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and College 082812
Site Code : 66012154
Start Date : 8/28/2012
Page No : 3

	Eastbound					College Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	1	1	2	0	6	0	8	0	87	0	0	87	1	**149**	0	**2**	**152**	248
07:45 AM	0	0	0	0	0	**5**	0	13	0	18	0	93	**2**	0	95	1	143	0	0	144	257
08:00 AM	0	0	0	0	0	1	0	10	0	11	0	**137**	1	2	**140**	0	132	0	0	132	**283**
08:15 AM	0	0	0	1	1	2	0	**21**	0	**23**	0	134	1	**3**	138	**2**	107	0	0	109	271
Total Volume	0	0	0	2	2	10	0	50	0	60	0	451	4	5	460	4	531	0	2	537	1059
% App. Total	0	0	0	100		16.7	0	83.3	0		0	98	0.9	1.1		0.7	98.9	0	0.4		
PHF	.000	.000	.000	.500	.500	.500	.000	.595	.000	.652	.000	.823	.500	.417	.821	.500	.891	.000	.250	.883	.936



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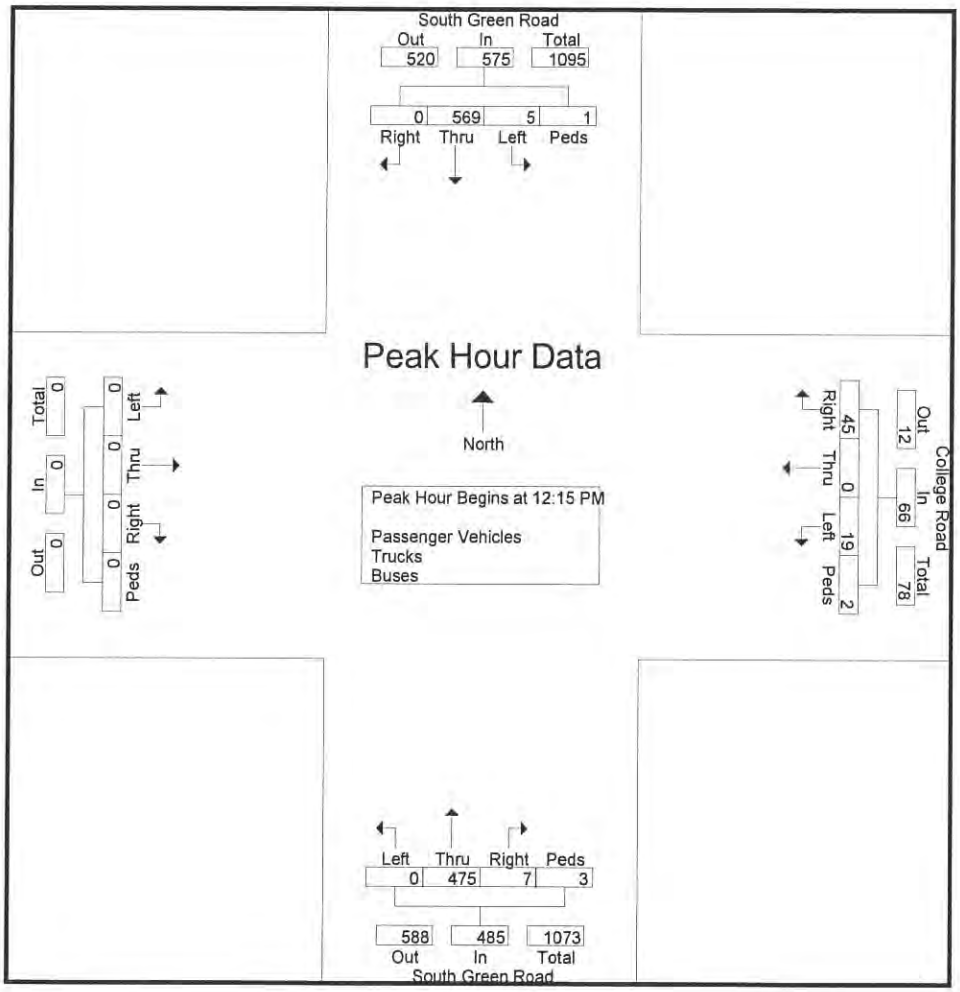
	Eastbound					College Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	0	0	0	0	0	3	0	10	**2**	15	0	100	**3**	1	104	**2**	124	0	0	126	245
12:30 PM	0	0	0	0	0	1	0	**13**	0	14	0	114	0	**2**	116	1	**158**	0	0	**159**	289
12:45 PM	0	0	0	0	0	7	0	11	0	18	0	**133**	1	0	**134**	0	132	0	0	132	284
01:00 PM	0	0	0	0	0	**8**	0	11	0	**19**	0	128	3	0	131	2	155	0	**1**	158	**308**
Total Volume	0	0	0	0	0	19	0	45	2	66	0	475	7	3	485	5	569	0	1	575	1126
% App. Total	0	0	0	0		28.8	0	68.2	3		0	97.9	1.4	0.6		0.9	99	0	0.2		
PHF	.000	.000	.000	.000	.000	.594	.000	.865	.250	.868	.000	.893	.583	.375	.905	.625	.900	.000	.250	.904	.914



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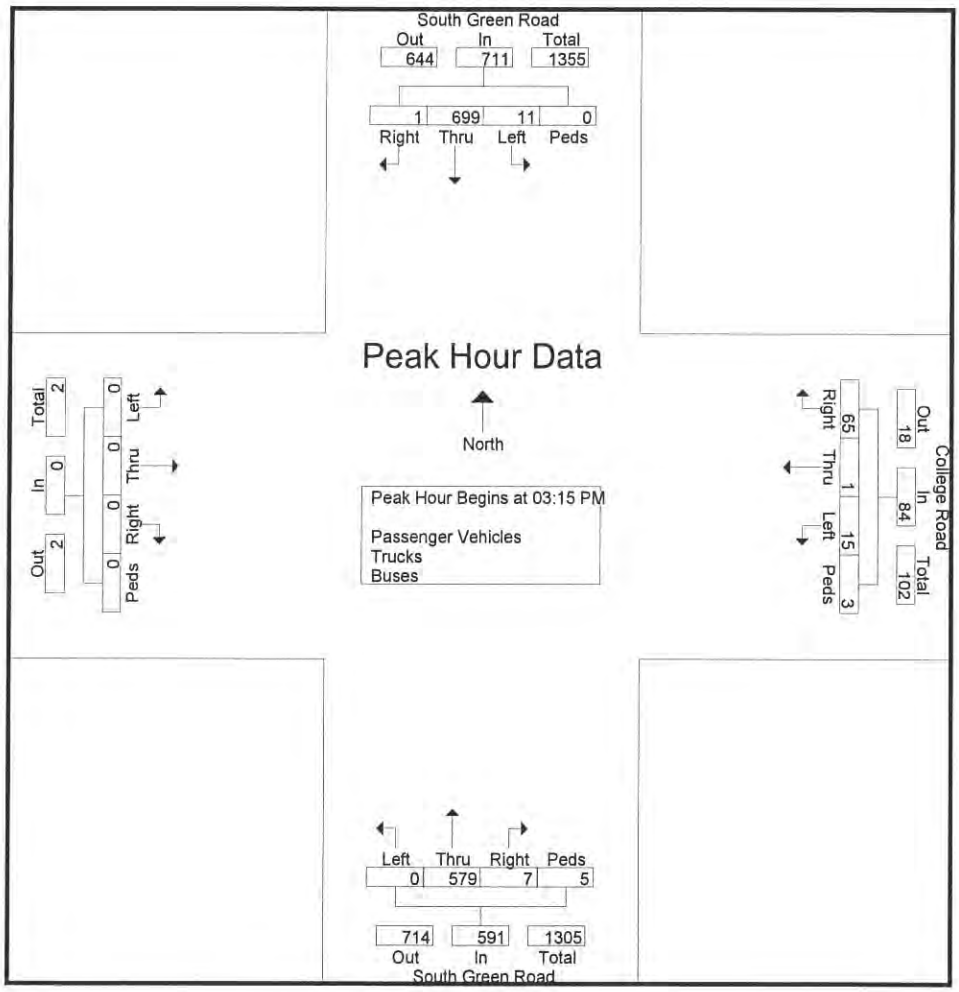
South Green Road / College Road Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and College 082812
Site Code : 66012154
Start Date : 8/28/2012
Page No : 5

	Eastbound					College Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	0	0	0	0	0	3	0	16	0	19	0	143	1	0	144	3	186	0	0	189	352
03:30 PM	0	0	0	0	0	3	1	18	0	22	0	175	1	0	176	4	142	0	0	146	344
03:45 PM	0	0	0	0	0	2	0	12	2	16	0	145	4	3	152	2	206	0	0	208	376
04:00 PM	0	0	0	0	0	7	0	19	1	27	0	116	1	2	119	2	165	1	0	168	314
Total Volume	0	0	0	0	0	15	1	65	3	84	0	579	7	5	591	11	699	1	0	711	1386
% App. Total	0	0	0	0		17.9	1.2	77.4	3.6		0	98	1.2	0.8		1.5	98.3	0.1	0		
PHF	.000	.000	.000	.000	.000	.536	.250	.855	.375	.778	.000	.827	.438	.417	.839	.688	.848	.250	.000	.855	.922



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Cedar Road / South Green Road Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Cedar 082812
Site Code : 74022154
Start Date : 8/28/2012
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Cedar Road Eastbound					Cedar Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	4	172	13	0	189	8	171	15	0	194	10	23	5	0	38	60	33	4	0	97	518
07:15 AM	17	167	7	1	192	18	212	18	0	248	18	21	13	1	53	72	51	17	0	140	633
07:30 AM	14	210	38	5	267	21	216	33	0	270	14	26	18	1	59	48	62	15	4	129	725
07:45 AM	19	219	11	2	251	39	155	8	2	204	19	37	19	1	76	76	80	24	0	180	711
Total	54	768	69	8	899	86	754	74	2	916	61	107	55	3	226	256	226	60	4	546	2587
08:00 AM	33	222	13	1	269	26	214	38	0	278	25	38	18	3	84	69	58	14	0	141	772
08:15 AM	33	189	19	0	241	21	165	33	0	219	29	41	26	1	97	72	54	10	0	136	693
08:30 AM	26	168	20	0	214	30	197	39	1	267	21	31	21	1	74	54	45	14	0	113	668
08:45 AM	26	178	14	1	219	20	163	35	0	218	23	33	14	3	73	69	52	20	2	143	653
Total	118	757	66	2	943	97	739	145	1	982	98	143	79	8	328	264	209	58	2	533	2786
09:00 AM	23	150	16	1	190	23	200	44	0	267	21	35	7	2	65	47	36	18	2	103	625
09:15 AM	17	133	7	0	157	18	151	28	0	197	30	30	16	2	78	57	43	15	0	115	547
09:30 AM	23	134	10	1	168	15	128	35	1	179	27	36	14	2	79	54	443	13	0	510	936
09:45 AM	29	146	13	0	188	17	121	47	1	186	26	43	11	4	84	52	45	10	0	107	565
Total	92	563	46	2	703	73	600	154	2	829	104	144	48	10	306	210	567	56	2	835	2673
10:00 AM	21	124	27	1	173	26	154	29	2	211	18	39	24	3	84	28	35	10	0	73	541
10:15 AM	23	128	23	1	175	26	145	30	1	202	18	36	24	0	78	32	38	11	0	81	536
10:30 AM	27	147	19	1	194	27	141	31	0	199	17	34	25	1	77	38	42	13	0	93	563
10:45 AM	30	168	15	2	215	28	135	32	1	196	16	31	26	0	73	43	46	15	0	104	588
Total	101	567	84	5	757	107	575	122	4	808	69	140	99	4	312	141	161	49	0	351	2228
11:00 AM	34	198	11	1	244	28	140	33	0	201	16	29	26	0	71	51	50	17	0	118	634
11:15 AM	30	168	17	5	220	22	128	28	0	178	27	34	16	3	80	46	45	23	2	116	594
11:30 AM	28	160	23	2	213	23	143	42	0	208	27	31	20	0	78	42	42	19	0	103	602
11:45 AM	20	117	20	1	158	23	96	23	0	142	29	54	20	1	104	53	56	36	2	147	551
Total	112	643	71	9	835	96	507	126	0	729	99	148	82	4	333	192	193	95	4	484	2381
12:00 PM	29	160	23	0	212	34	144	26	0	204	26	33	16	2	77	55	47	32	1	135	628
12:15 PM	19	166	23	1	209	27	151	20	0	198	35	43	19	0	97	46	52	27	3	128	632
12:30 PM	19	197	19	1	236	14	173	28	0	215	20	27	18	0	65	53	52	17	0	122	638
12:45 PM	31	180	23	1	235	22	166	39	0	227	21	46	24	2	93	60	50	32	0	142	697
Total	98	703	88	3	892	97	634	113	0	844	102	149	77	4	332	214	201	108	4	527	2595
01:00 PM	32	171	24	0	227	31	181	20	0	232	21	43	28	0	92	47	51	35	0	133	684
01:15 PM	35	177	15	1	228	25	132	38	0	195	36	31	24	0	91	44	45	25	1	115	629
01:30 PM	22	145	24	0	191	33	186	26	3	248	25	34	20	1	80	44	58	23	0	125	644
01:45 PM	19	172	16	0	207	45	134	25	2	206	27	42	29	1	99	55	44	26	1	126	638
Total	108	665	79	1	853	134	633	109	5	881	109	150	101	2	362	190	198	109	2	499	2595
02:00 PM	21	171	17	0	209	43	142	27	2	214	26	41	27	2	96	54	43	21	0	118	637
02:15 PM	23	176	18	0	217	41	150	30	1	222	24	43	25	1	93	52	42	20	0	114	646
02:30 PM	25	182	19	0	226	39	159	32	2	232	23	45	23	2	93	50	40	18	0	108	659
02:45 PM	27	188	20	0	235	36	167	34	2	239	22	47	22	1	92	48	38	16	0	102	668
Total	96	717	74	0	887	159	618	123	7	907	95	176	97	6	374	204	163	75	0	442	2610
03:00 PM	29	198	21	0	248	34	181	36	1	252	21	50	21	1	93	46	37	15	0	98	691
03:15 PM	38	176	18	0	232	28	131	25	2	186	29	46	22	1	98	62	53	26	0	141	657

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Cedar Road / South Green Road Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Cedar 082812
Site Code : 74022154
Start Date : 8/28/2012
Page No : 2

Groups Printed- Passenger Vehicles - Trucks - Buses

	Cedar Road Eastbound					Cedar Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:30 PM	36	184	20	3	243	29	172	37	0	238	19	42	25	1	87	52	68	17	0	137	705
03:45 PM	27	160	28	0	215	28	141	35	1	205	42	67	21	0	130	67	78	22	1	168	718
Total	130	718	87	3	938	119	625	133	4	881	111	205	89	3	408	227	236	80	1	544	2771
04:00 PM	27	189	26	4	246	36	152	29	1	218	27	46	20	1	94	59	69	23	0	151	709
04:15 PM	18	139	31	1	189	33	158	23	9	223	43	46	21	0	110	67	57	22	6	152	674
04:30 PM	30	227	21	0	278	29	196	38	0	263	24	54	20	1	99	56	63	22	0	141	781
04:45 PM	13	174	14	5	206	31	156	29	1	217	32	55	27	0	114	81	63	24	1	169	706
Total	88	729	92	10	919	129	662	119	11	921	126	201	88	2	417	263	252	91	7	613	2870
05:00 PM	22	205	22	0	249	25	188	41	3	257	22	58	17	0	97	70	59	29	0	158	761
05:15 PM	29	191	19	0	239	33	167	22	0	222	35	58	22	1	116	82	71	25	0	178	755
05:30 PM	32	203	14	0	249	39	211	27	0	277	23	60	15	5	103	52	71	19	4	146	775
05:45 PM	38	219	17	2	276	45	178	28	0	251	28	56	25	0	109	60	61	35	1	157	793
Total	121	818	72	2	1013	142	744	118	3	1007	108	232	79	6	425	264	262	108	5	639	3084
06:00 PM	19	217	17	0	253	39	220	28	0	287	28	40	31	1	100	50	44	15	0	109	749
06:15 PM	27	181	21	0	229	25	172	22	2	221	24	47	16	0	87	53	63	24	1	141	678
06:30 PM	19	168	23	2	212	26	163	25	1	215	20	30	18	1	69	37	30	12	2	81	577
06:45 PM	40	185	23	1	249	36	182	29	4	251	22	40	12	2	76	41	58	22	0	121	697
Total	105	751	84	3	943	126	737	104	7	974	94	157	77	4	332	181	195	73	3	452	2701
Grand Total	1223	8399	912	48	10582	1365	7828	1440	46	10679	1176	1952	971	56	4155	2606	2863	962	34	6465	31881
Apprch %	11.6	79.4	8.6	0.5		12.8	73.3	13.5	0.4		28.3	47	23.4	1.3		40.3	44.3	14.9	0.5		
Total %	3.8	26.3	2.9	0.2	33.2	4.3	24.6	4.5	0.1	33.5	3.7	6.1	3	0.2	13	8.2	9	3	0.1	20.3	
Passenger Vehicles	1205	8196	902	48	10351	1354	7633	1421	46	10454	1164	1930	957	56	4107	2580	2833	945	34	6392	31304
% Passenger Vehicles	98.5	97.6	98.9	100	97.8	99.2	97.5	98.7	100	97.9	99	98.9	98.6	100	98.8	99	99	98.2	100	98.9	98.2
Trucks	13	147	7	0	167	8	146	16	0	170	9	4	9	0	22	24	16	10	0	50	409
% Trucks	1.1	1.8	0.8	0	1.6	0.6	1.9	1.1	0	1.6	0.8	0.2	0.9	0	0.5	0.9	0.6	1	0	0.8	1.3
Buses	5	56	3	0	64	3	49	3	0	55	3	18	5	0	26	2	14	7	0	23	168
% Buses	0.4	0.7	0.3	0	0.6	0.2	0.6	0.2	0	0.5	0.3	0.9	0.5	0	0.6	0.1	0.5	0.7	0	0.4	0.5

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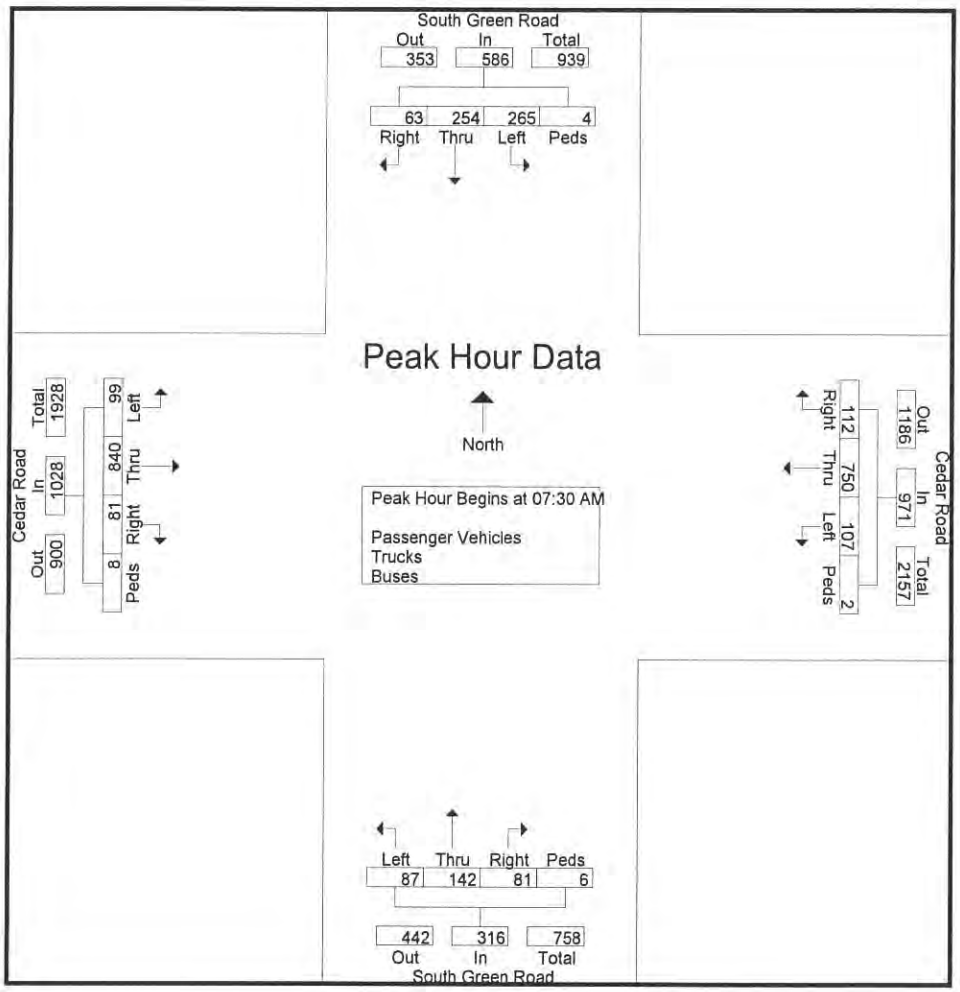
Cedar Road / South Green Road Intersection

Project Number: 2012154.00
Project Name: Traffic Study
Project Location: South Euclid, OH
Client Name: Cuyahoga County Public Library

File Name : South Green and Cedar 082812
Site Code : 74022154
Start Date : 8/28/2012
Page No : 3

	Cedar Road Eastbound					Cedar Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	14	210	**38**	**5**	267	21	**216**	33	0	270	14	26	18	1	59	48	62	15	**4**	129	725
07:45 AM	19	219	11	2	251	**39**	155	8	**2**	204	19	37	19	1	76	**76**	**80**	**24**	0	**180**	711
08:00 AM	**33**	**222**	13	1	**269**	26	214	**38**	0	**278**	25	38	18	**3**	84	69	58	14	0	141	**772**
08:15 AM	33	189	19	0	241	21	165	33	0	219	**29**	**41**	**26**	1	**97**	72	54	10	0	136	693
Total Volume	99	840	81	8	1028	107	750	112	2	971	87	142	81	6	316	265	254	63	4	586	2901
% App. Total	9.6	81.7	7.9	0.8		11	77.2	11.5	0.2		27.5	44.9	25.6	1.9		45.2	43.3	10.8	0.7		
PHF	.750	.946	.533	.400	.955	.686	.868	.737	.250	.873	.750	.866	.779	.500	.814	.872	.794	.656	.250	.814	.939



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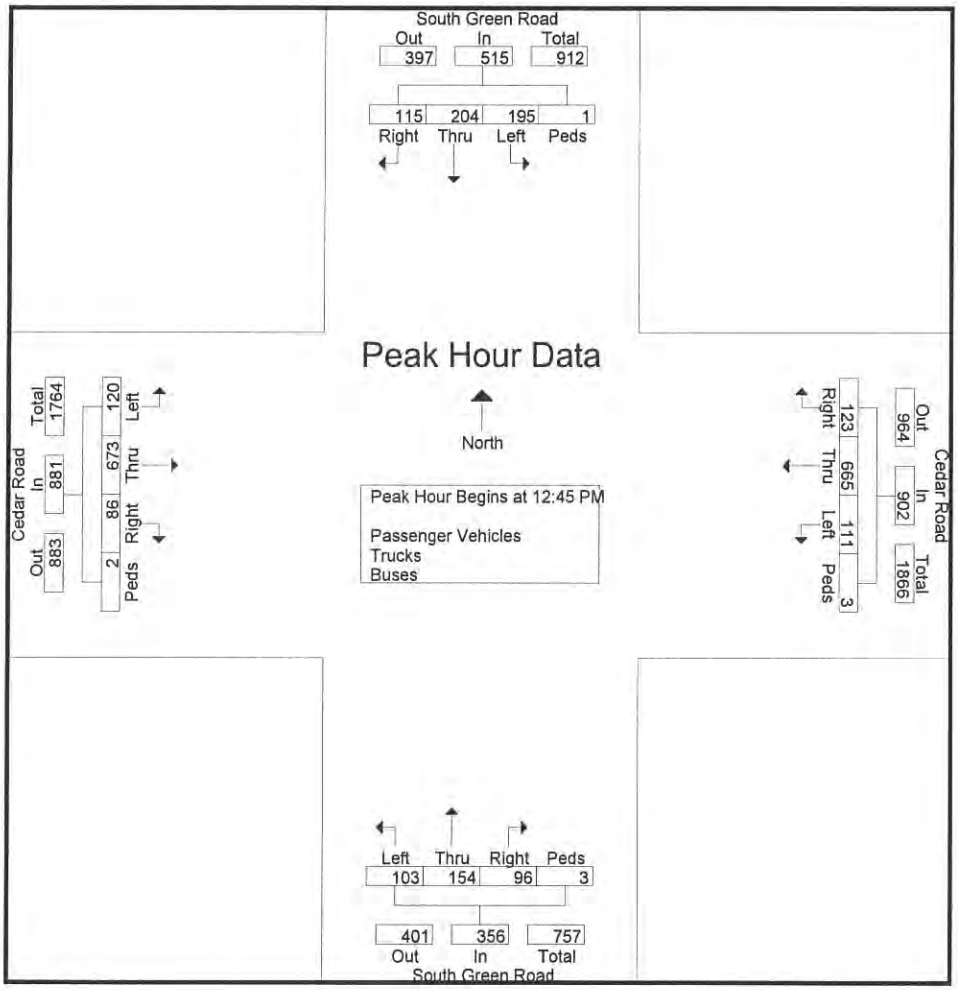
File Name : South Green and Cedar 082812
Site Code : 74022154
Start Date : 8/28/2012
Page No : 4

	Cedar Road Eastbound					Cedar Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:45 PM																					
12:45 PM	31	**180**	23	**1**	**235**	22	166	**39**	0	227	21	**46**	24	**2**	**93**	**60**	50	32	0	**142**	**697**
01:00 PM	32	171	**24**	0	227	31	181	20	0	232	21	43	**28**	0	92	47	51	**35**	0	133	684
01:15 PM	**35**	177	15	1	228	25	132	38	0	195	**36**	31	24	0	91	44	45	25	**1**	115	629
01:30 PM	22	145	24	0	191	**33**	**186**	26	**3**	**248**	25	34	20	1	80	44	**58**	23	0	125	644
Total Volume	120	673	86	2	881	111	665	123	3	902	103	154	96	3	356	195	204	115	1	515	2654
% App. Total	13.6	76.4	9.8	0.2		12.3	73.7	13.6	0.3		28.9	43.3	27	0.8		37.9	39.6	22.3	0.2		
PHF	.857	.935	.896	.500	.937	.841	.894	.788	.250	.909	.715	.837	.857	.375	.957	.813	.879	.821	.250	.907	.952



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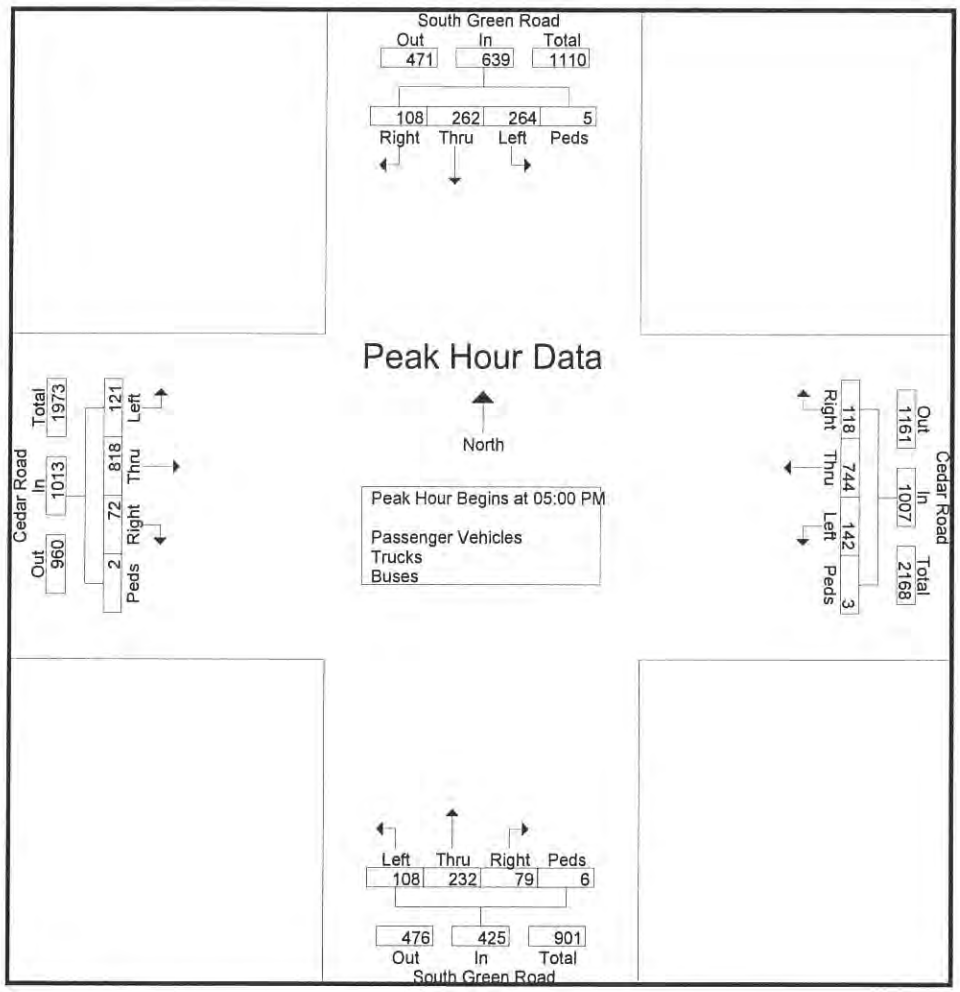
	Cedar Road Eastbound					Cedar Road Westbound					South Green Road Northbound					South Green Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	22	205	**22**	0	249	25	188	**41**	**3**	257	22	58	17	0	97	70	59	29	0	158	761
05:15 PM	29	191	19	0	239	33	167	22	0	222	**35**	58	22	1	**116**	**82**	**71**	25	0	**178**	755
05:30 PM	32	203	14	0	249	39	**211**	27	0	**277**	23	**60**	15	**5**	103	52	71	19	**4**	146	775
05:45 PM	**38**	**219**	17	**2**	**276**	**45**	178	28	0	251	28	56	**25**	0	109	60	61	**35**	1	157	**793**
Total Volume	121	818	72	2	1013	142	744	118	3	1007	108	232	79	6	425	264	262	108	5	639	3084
% App. Total	11.9	80.8	7.1	0.2		14.1	73.9	11.7	0.3		25.4	54.6	18.6	1.4		41.3	41	16.9	0.8		
PHF	.796	.934	.818	.250	.918	.789	.882	.720	.250	.909	.771	.967	.790	.300	.916	.805	.923	.771	.313	.897	.972



APPENDIX C
ITE TRIP GENERATION CALCULATIONS

ITE Trip Generation Procedure

Land Use 590 (Library)

Trip Generations per Square Feet of Gross Floor Area

Weekday Trip Generation and Trip Distribution

Trip Generation Formula: Ln(T) = 0.69 Ln(X) + 5.05
where: T = Number of Trips Generated
X = Square Feet of Gross Floor Area

Proposed Square Feet of Floor Area: 30,000

Total Trip Ends in the Average Weekday: 1,631

Distribution Percentages of Entering and Exiting Trips, From ITE Trip Generation Manual, 9th Edition

Entering Trip Percentage: 50%
Exiting Trip Percentage: 50%
Number of Entering Trips: *816*
Number of Exiting Trips: *815*

AM Peak Trip Generation and Trip Distribution (Peak Hour of Adjacent Street)

Trip Generation Formula: T = 1.32 (X) - 5.84
where: T = Number of Trips Generated
X = Square Feet of Gross Floor Area

Proposed Square Feet of Floor Area: 30,000

Total Trip Ends in the AM Peak Hour: 34

Distribution Percentages of Entering and Exiting Trips, From ITE Trip Generation Manual, 9th Edition

Entering Trip Percentage: 71%
Exiting Trip Percentage: 29%

Entering Primary Trips: 24
Exiting Primary Trips: 10

PM Peak Trip Generation and Trip Distribution (Peak Hour of Adjacent Street)

Trip Generation Formula: Ln(T) = 0.91 Ln(X) + 2.22
where: T = Number of Trips Generated
X = Square Feet of Gross Floor Area

Proposed Square Feet of Floor Area: 30,000

Total Trip Ends in the PM Peak Hour: 204

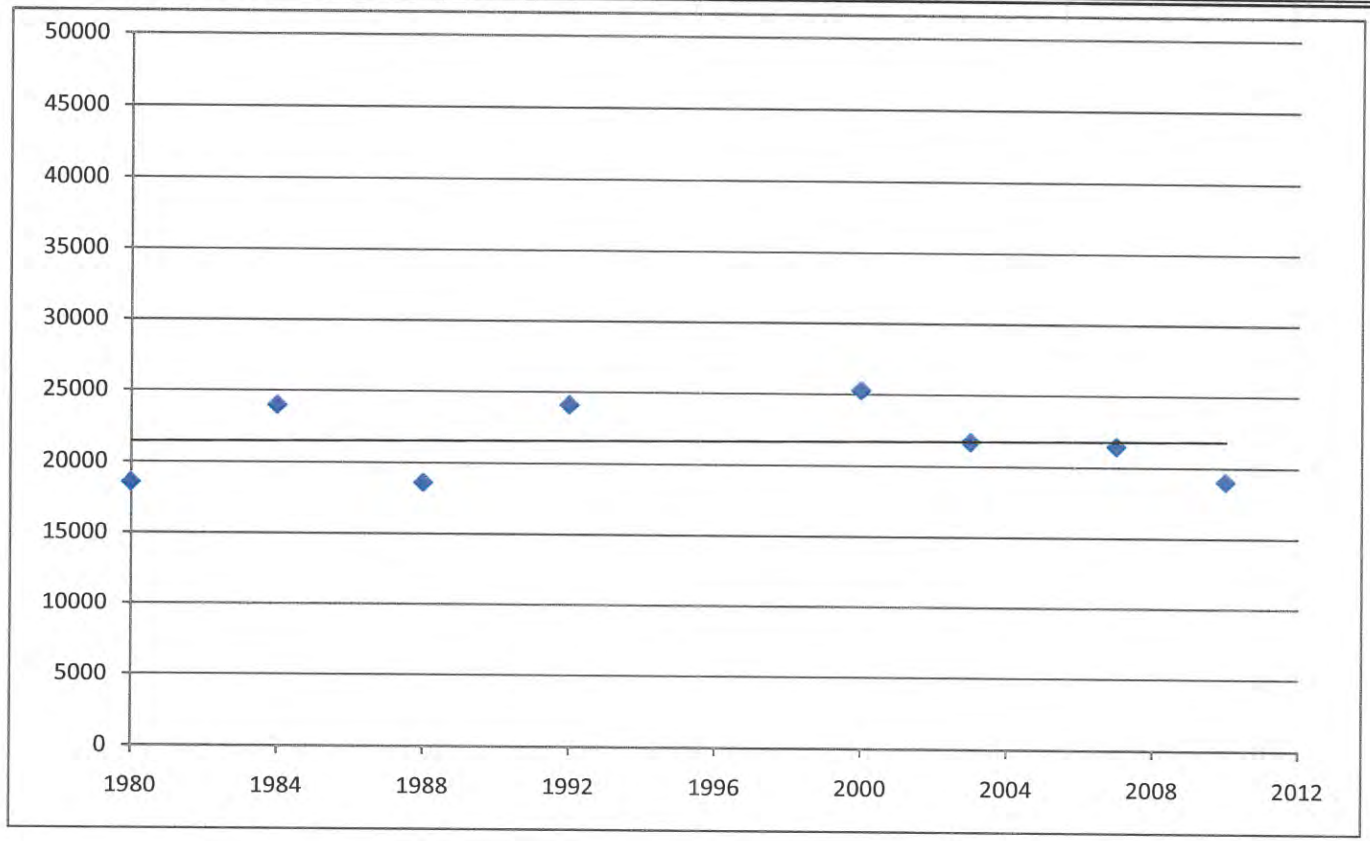
Distribution Percentages of Entering and Exiting Trips, From ITE Trip Generation Manual, 9th Edition

Entering Trip Percentage: 48%
Exiting Trip Percentage: 52%

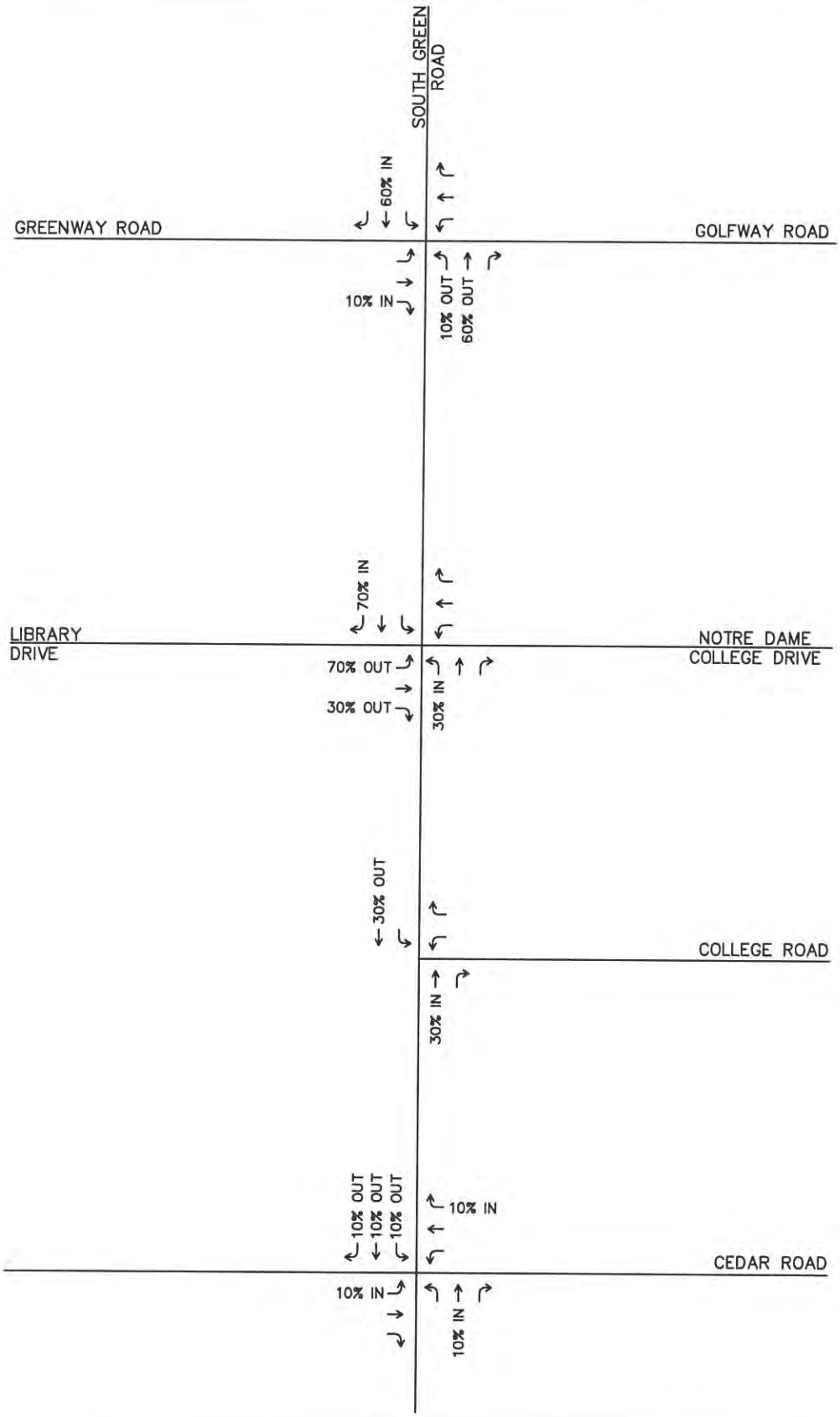
Entering Primary Trips: 98
Exiting Primary Trips: 106

APPENDIX D
GROWTH RATE CALCULATIONS

Roadway Section	"Mayfield Road" - Historical Traffic Volumes								Growth Rate
	1980	1984	1988	1992	2000	2003	2007	2010	
"Mayfield Road at West Corporation Limit of South Euclid"	18620	24030	18670	24140	25310	21740	21490	19080	
Trendline	*21432*	*21484*	*21537*	*21589*	*21694*	*21733*	*21786*	*21825*	*0.06%*



APPENDIX E
SITE TRIP DISTRIBUTION AND ASSIGNMENT



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N.T.S.

APPENDIX E

LIBRARY SITE TRIP DISTRIBUTION

JANUARY 2013

GPD GROUP

520 South Main Street, Suite 2531, Akron, Ohio 44311
330-572-2100 Fax 330-572-2101

CAD FILE: G:\2012\201254\TRAFFIC\DWG\SITE DISTRIBUTION.DWG
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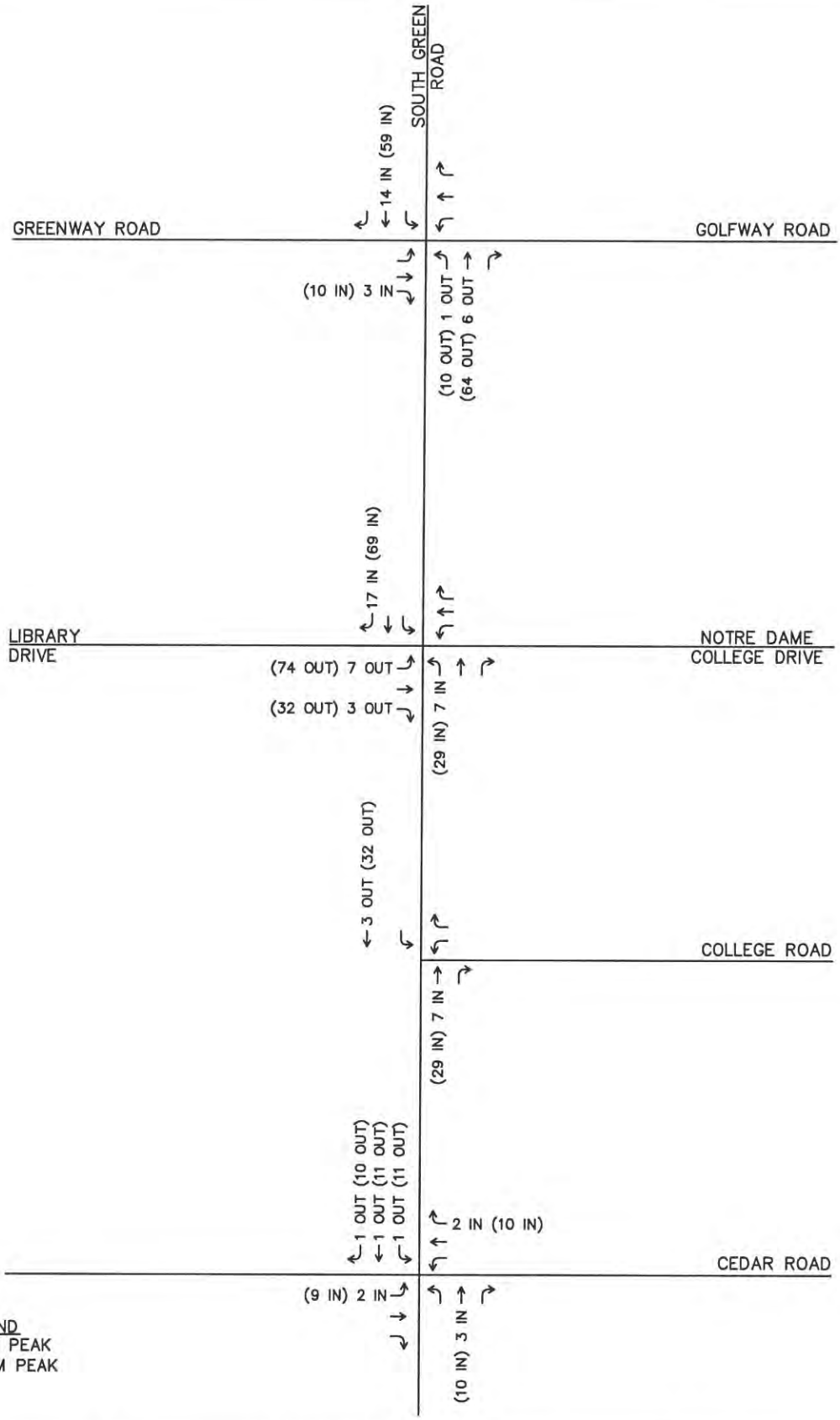
TECHNICIAN: SMAXE



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N

N.T.S.

APPENDIX E

LIBRARY SITE TRIP ASSIGNMENT

JANUARY 2013

GPD GROUP
520 South Main Street, Suite 2531, Akron,Ohio 44311
330-572-2100 Fax 330-572-2101

APPENDIX F
TRAFFIC SIGNAL WARRANT ANALYSIS

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 10/02/12
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Northbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **4,800**

Southbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **6,091**

Minor Street Approaches

Eastbound: **Greenway Road**
Number of Lanes: **1**
Total Approach Volume: **434**

Westbound: **Golfway Road**
Number of Lanes: **1**
Total Approach Volume: **296**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... Not Satisfied

Warrant 1A - Minimum Vehicular Volume ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... Not Satisfied
Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour ..... Not Satisfied

Warrant 3A - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... Not Satisfied
Volumes do not exceed minimums for any hour.

Warrant 4 - Pedestrian Volumes ..... Not Evaluated

Warrant 5 - School Crossing ..... Not Evaluated

Warrant 6 - Coordinated Signal System ..... Not Evaluated

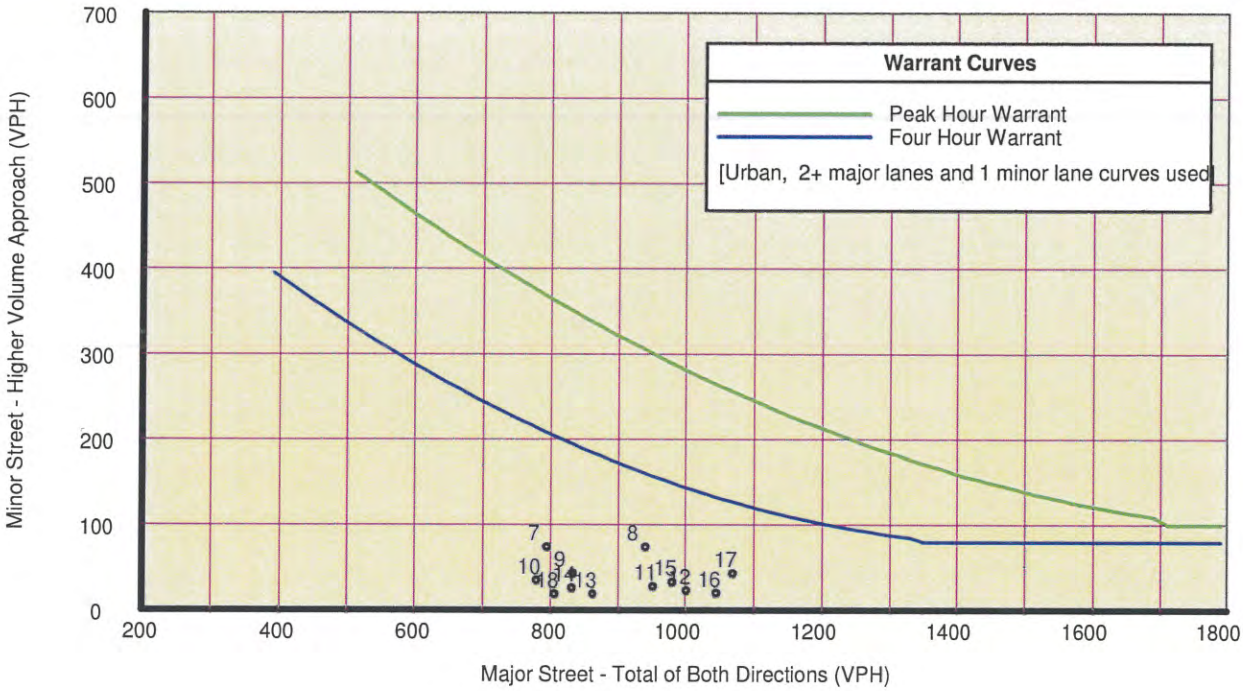
Warrant 7 - Crash Experience ..... Not Evaluated

Warrant 8 - Roadway Network ..... Not Evaluated

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 10/02/12
Page No. : 2

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
01:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
02:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
03:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
04:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
05:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
06:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
07:00	794	74	EB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
08:00	940	74	EB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
09:00	833	43	EB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
10:00	779	35	EB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
11:00	951	28	EB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
12:00	1,001	23	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
13:00	862	19	EB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
14:00	831	26	EB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
15:00	980	33	EB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
16:00	1,045	20	EB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
17:00	1,069	43	EB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
18:00	806	19	EB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
19:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
20:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
21:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
22:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
23:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 10/02/12
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Northbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **6,584**

Southbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **6,069**

Minor Street Approaches

Eastbound:
Number of Lanes: **2**

Total Approach Volume: **8**

Westbound: **Notre Dame College Drive**
Number of Lanes: **2**

Total Approach Volume: **945**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... Not Satisfied

Warrant 1A - Minimum Vehicular Volume ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... Not Satisfied
Required volumes reached for 6 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... Not Satisfied
Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour ..... Not Satisfied

Warrant 3A - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... Not Satisfied
Volumes do not exceed minimums for any hour.

Warrant 4 - Pedestrian Volumes ..... Not Evaluated

Warrant 5 - School Crossing ..... Not Evaluated

Warrant 6 - Coordinated Signal System ..... Not Evaluated

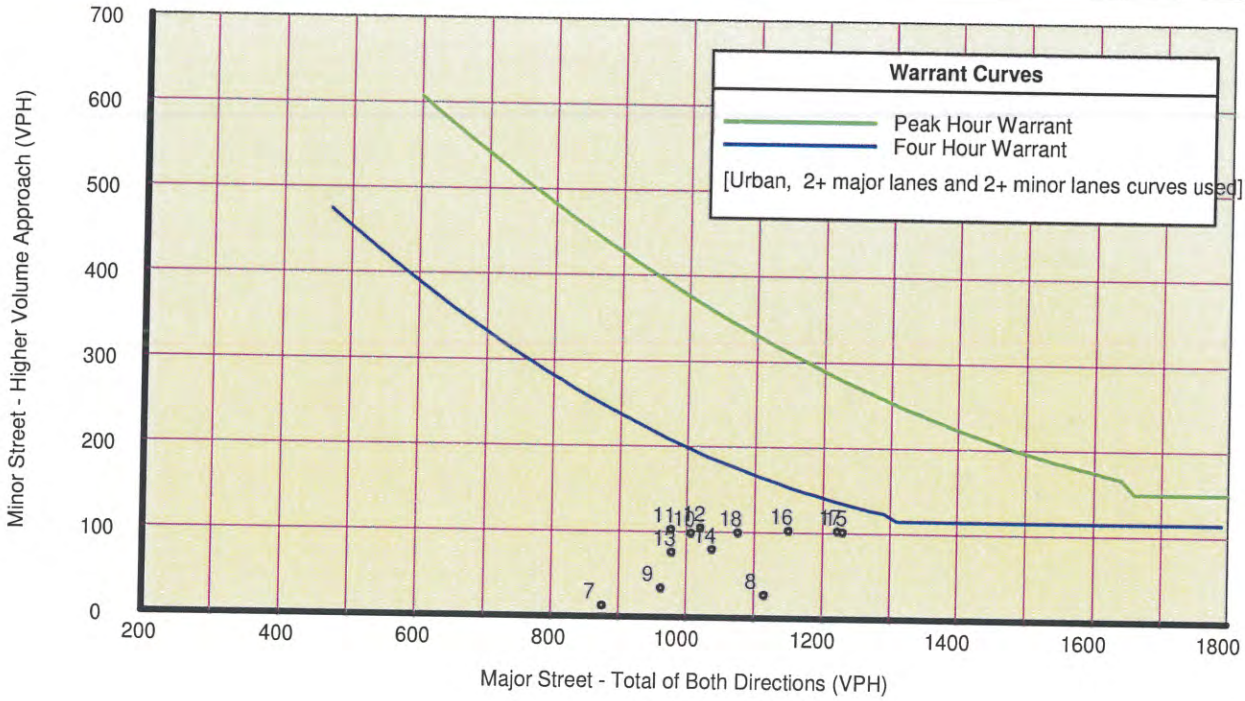
Warrant 7 - Crash Experience ..... Not Evaluated

Warrant 8 - Roadway Network ..... Not Evaluated

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 10/02/12
Page No. : 2

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour Begin	Major Total	Higher Minor Vol	Higher Minor Dir	War-1A Major Crit	War-1A Minor Crit	War-1A Meets?	War-1B Major Crit	War-1B Minor Crit	War-1B Meets?	War-1A&B Major Crit	War-1A&B Minor Crit	War-1A&B Meets?
00:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
01:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
02:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
03:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
04:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
05:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
06:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
07:00	876	13	WB	600-Yes	200-No	Major	900-No	100-No	---	720-Yes	160-No	Major
08:00	1,115	27	WB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
09:00	963	34	WB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
10:00	1,007	99	WB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
11:00	977	103	WB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
12:00	1,021	105	WB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
13:00	978	76	WB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
14:00	1,038	80	WB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
15:00	1,230	102	WB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
16:00	1,150	103	WB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
17:00	1,222	103	WB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
18:00	1,076	100	WB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
19:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
20:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
21:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
22:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
23:00	0	0	EB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 09/07/12
Page No. : 1

Signal Warrants - Summary

Major Street Approaches

Northbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **5,476**

Southbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **6,243**

Minor Street Approaches

Eastbound:
Number of Lanes: **1**

Total Approach Volume: **0**

Westbound: **College Road**
Number of Lanes: **1**

Total Approach Volume: **760**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... Not Satisfied

Warrant 1A - Minimum Vehicular Volume ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... Not Satisfied
Required volumes reached for 1 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... Not Satisfied
Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour ..... Not Satisfied

Warrant 3A - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... Not Satisfied
Volumes do not exceed minimums for any hour.

Warrant 4 - Pedestrian Volumes ..... Not Evaluated

Warrant 5 - School Crossing ..... Not Evaluated

Warrant 6 - Coordinated Signal System ..... Not Evaluated

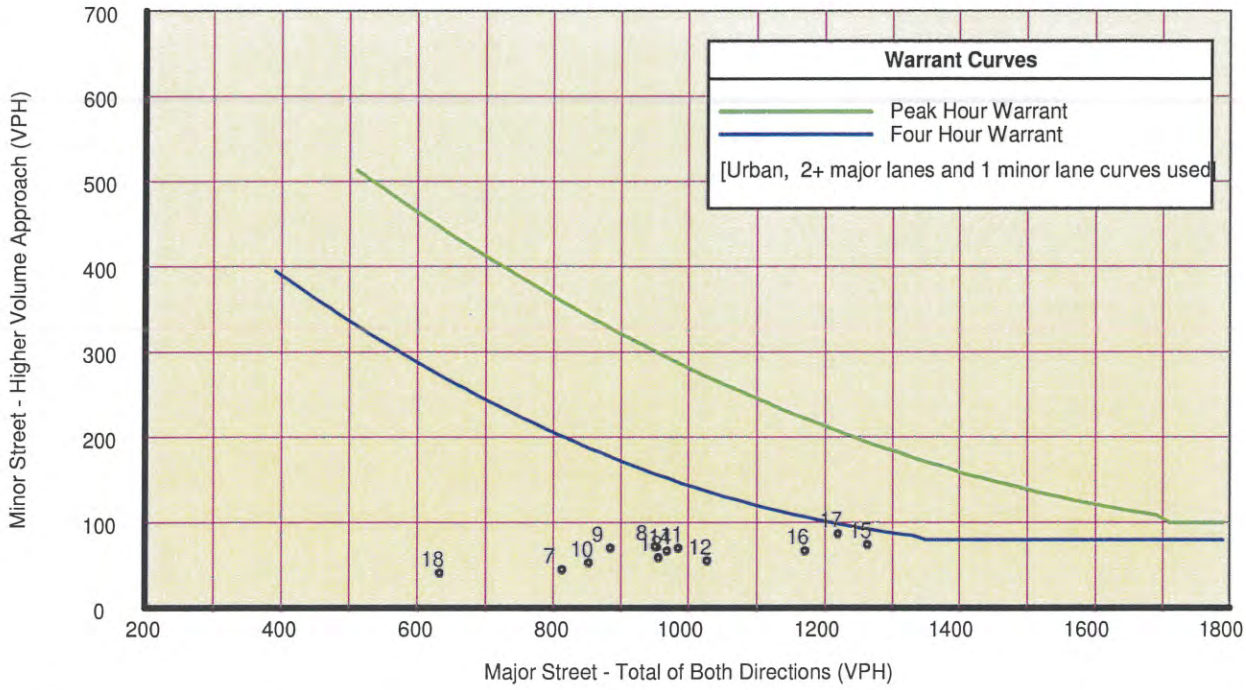
Warrant 7 - Crash Experience ..... Not Evaluated

Warrant 8 - Roadway Network ..... Not Evaluated

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 09/07/12

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
01:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
02:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
03:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
04:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
05:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
06:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
07:00	813	45	WB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
08:00	950	72	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
09:00	884	70	WB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
10:00	852	53	WB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
11:00	985	70	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
12:00	1,027	55	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
13:00	955	59	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
14:00	968	67	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
15:00	1,263	74	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
16:00	1,170	67	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
17:00	1,219	87	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
18:00	633	41	WB	600-Yes	150-No	Major	900-No	75-No	---	720-No	120-No	---
19:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
20:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
21:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
22:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
23:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : **09/07/12**

Signal Warrants - Summary

Major Street Approaches

Eastbound: **Cedar Road**
Number of Lanes: **2**
Approach Speed: **25**
Total Approach Volume: **10,534**

Westbound: **Cedar Road**
Number of Lanes: **2**
Approach Speed: **25**
Total Approach Volume: **10,633**

Minor Street Approaches

Northbound: **South Green Road**
Number of Lanes: **2**
Total Approach Volume: **4,099**

Southbound: **South Green Road**
Number of Lanes: **2**
Total Approach Volume: **6,431**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume ..... **Satisfied**
Required volumes reached for 12 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... **Satisfied**
Required volumes reached for 12 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... **Satisfied**
Required volumes reached for 12 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (12) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Satisfied**

Warrant 3A - Peak Hour Delay ..... **Not Satisfied**
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... **Satisfied**
Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes ..... **Not Evaluated**

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

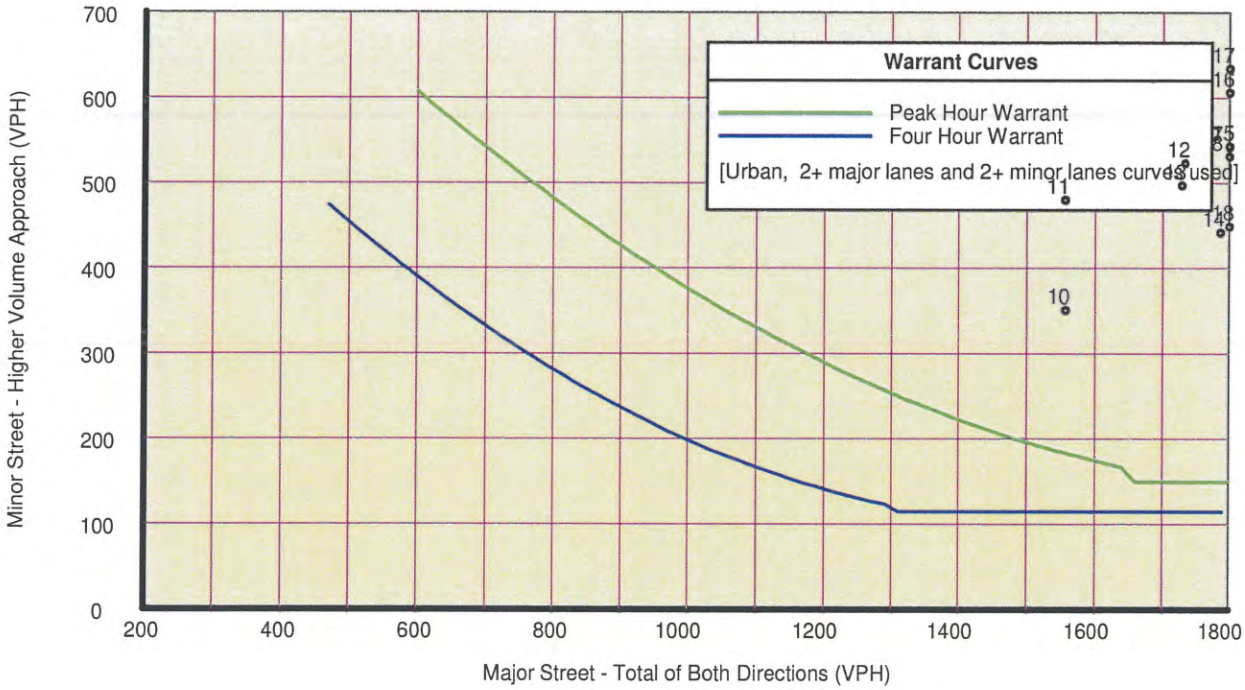
Warrant 7 - Crash Experience ..... **Not Evaluated**

Warrant 8 - Roadway Network ..... **Not Evaluated**

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 09/07/12

Signal Warrants - Summary

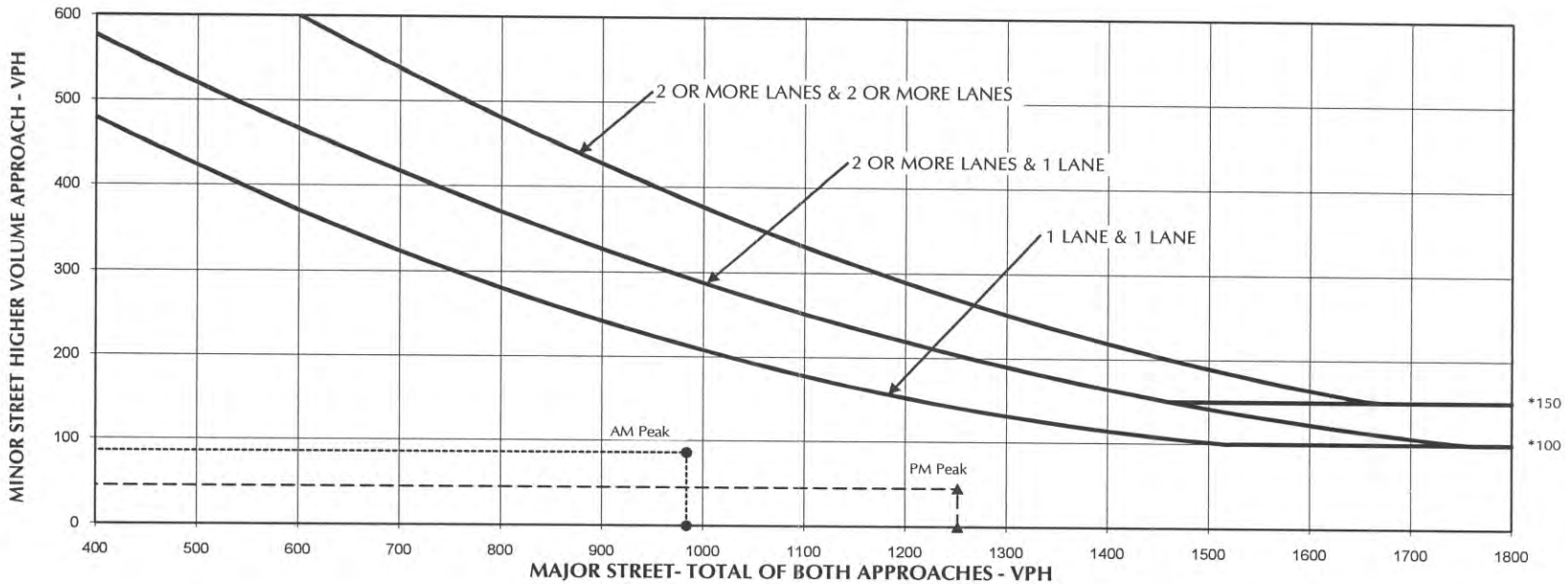


Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
01:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
02:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
03:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
04:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
05:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
06:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
07:00	1,805	542	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
08:00	1,922	531	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
09:00	1,528	833	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
10:00	1,556	351	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
11:00	1,555	480	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
12:00	1,733	523	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
13:00	1,728	497	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
14:00	1,787	442	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
15:00	1,812	543	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
16:00	1,819	606	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
17:00	2,015	634	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
18:00	1,907	449	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
19:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
20:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
21:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
22:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
23:00	0	0	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---

South Green Road / Greenway Road / Golfway Road Intersection

FIGURE 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies a the lower threshold volume for a minor-street with one lane.

		Lanes
Major Road=	South Green Road	2
Minor Road=	Greenway Road	1
Road Location=	Urban Criteria	

Traffic Scenario:
Opening Year 2013 'Build' Condition

AM Peak Hour Volumes	
Major Street - Total of Both Approaches =	984
Minor Street - Higher Volume Approach =	86
Midday Peak Hour Volumes	
Major Street - Total of Both Approaches =	0
Minor Street - Higher Volume Approach =	0
PM Peak Hour Volumes	
Major Street - Total of Both Approaches =	1252
Minor Street - Higher Volume Approach =	45

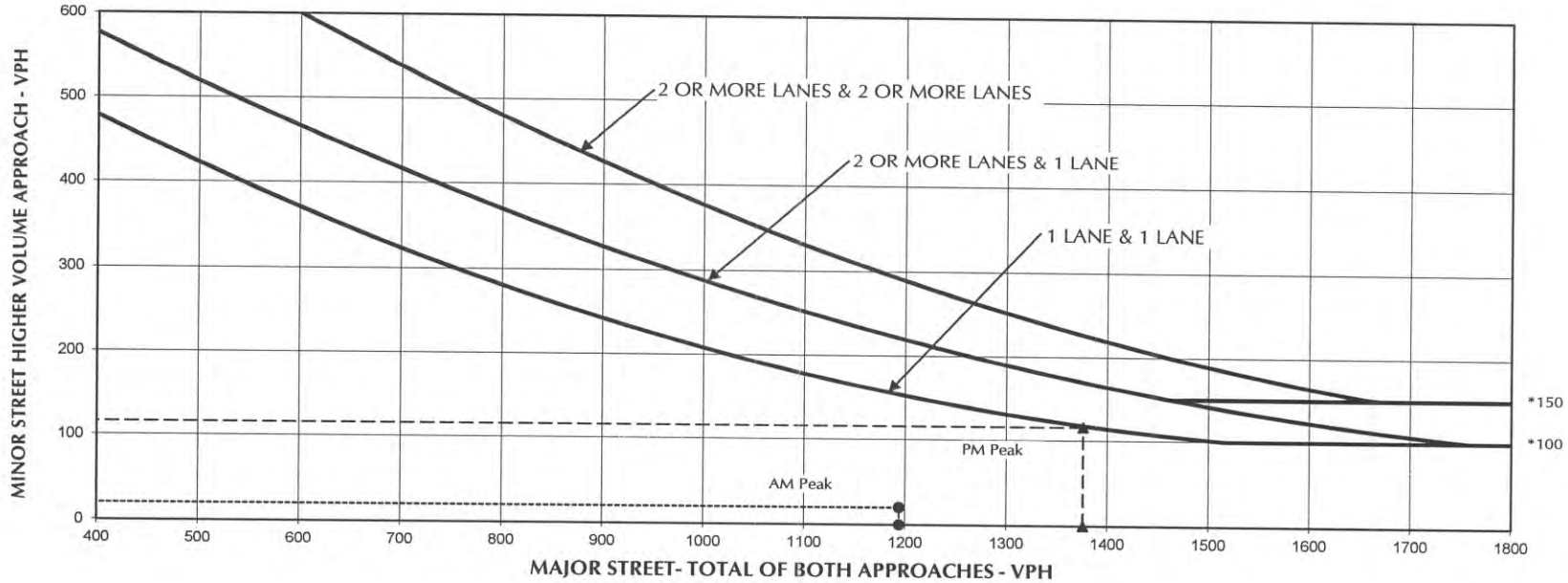
Warrant Met?

Warrant 3 (Urban)= No

GPD GROUP
520 South Main Street
Suite 2531
Akron, Ohio 44311
330.572.2100
Fax 330.572.2101

South Green Road / Notre Dame College Drive / Drive #1 Intersection

FIGURE 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies a the lower threshold volume for a minor-street with one lane.

		Lanes
Major Road=	South Green Road	2
Minor Road=	Notre Dame College	1
Road Location=	Urban Criteria	

Traffic Scenario:
Opening Year 2013 'Build' Conditions

AM Peak Hour Volumes	
Major Street - Total of Both Approaches =	1194
Minor Street - Higher Volume Approach =	20
Midday Peak Hour Volumes	
Major Street - Total of Both Approaches =	0
Minor Street - Higher Volume Approach =	0
PM Peak Hour Volumes	
Major Street - Total of Both Approaches =	1376
Minor Street - Higher Volume Approach =	116

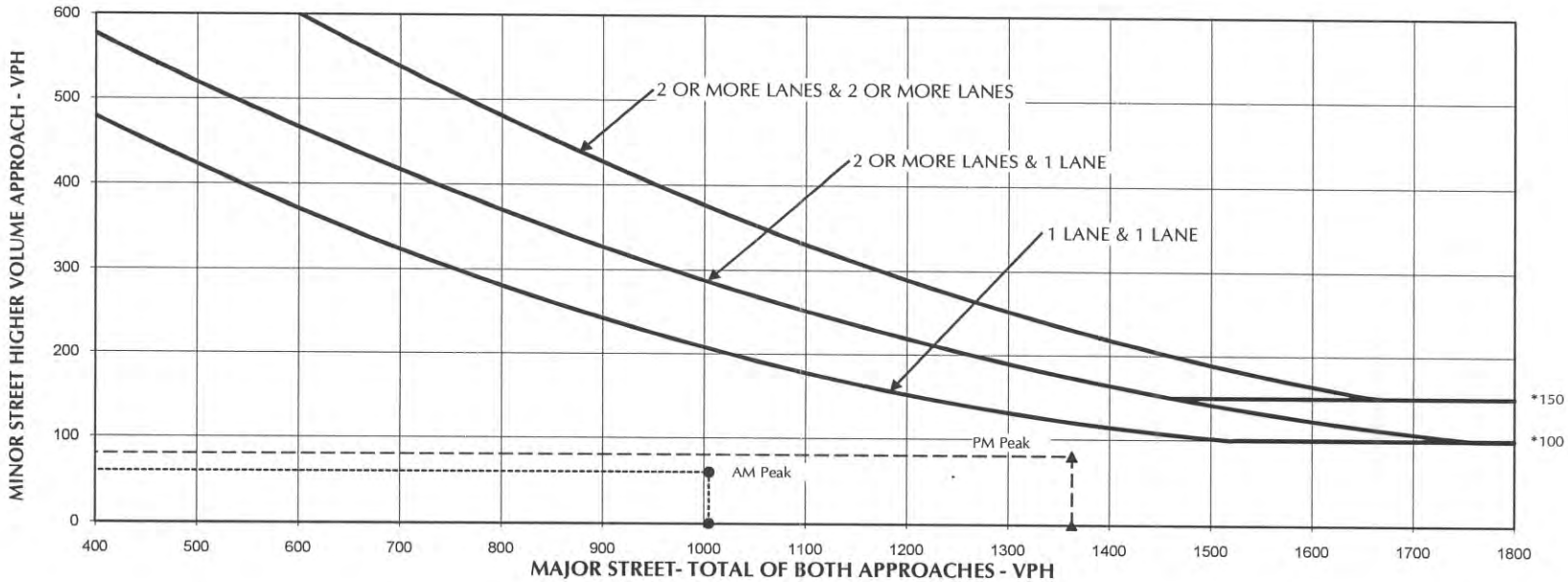
Warrant Met?

Warrant 3 (Urban)= **No**

GPD GROUP
520 South Main Street
Suite 2531
Akron, Ohio 44311
330.572.2100
Fax 330.572.2101

South Green Road / College Road Intersection

FIGURE 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies a the lower threshold volume for a minor-street with one lane.

		Lanes
Major Road=	South Green Road	2
Minor Road=	College Road	1
Road Location=	Urban Criteria	

Traffic Scenario:
Opening Year 2013 'Build' Condition

AM Peak Hour Volumes	
Major Street - Total of Both Approaches =	1005
Minor Street - Higher Volume Approach =	60
Midday Peak Hour Volumes	
Major Street - Total of Both Approaches =	0
Minor Street - Higher Volume Approach =	0
PM Peak Hour Volumes	
Major Street - Total of Both Approaches =	1363
Minor Street - Higher Volume Approach =	80

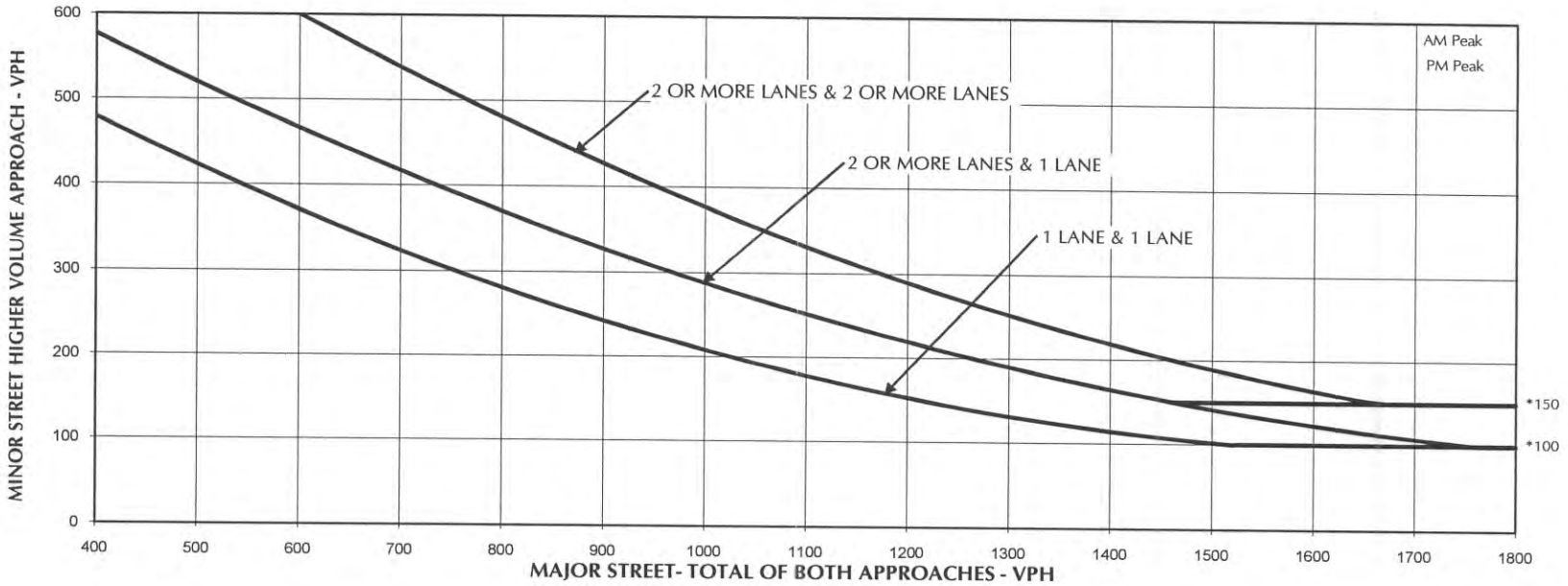
Warrant Met?

Warrant 3 (Urban)= **No**

GPD GROUP
520 South Main Street
Suite 2531
Akron, Ohio 44311
330.572.2100
Fax 330.572.2101

South Green Road / Cedar Road Intersection

FIGURE 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies a the lower threshold volume for a minor-street with one lane.

		Lanes
Major Road=	Cedar Road	2
Minor Road=	South Green Road	2
Road Location=	Urban Criteria	

Traffic Scenario:
Opening Year 2013 'Build' Condition

AM Peak Hour Volumes	
Major Street - Total of Both Approaches =	2003
Minor Street - Higher Volume Approach =	901
Midday Peak Hour Volumes	
Major Street - Total of Both Approaches =	0
Minor Street - Higher Volume Approach =	0
PM Peak Hour Volumes	
Major Street - Total of Both Approaches =	2045
Minor Street - Higher Volume Approach =	1100

Warrant Met?

Warrant 3 (Urban)= **Yes**

GPD GROUP
520 South Main Street
Suite 2531
Akron, Ohio 44311
330.572.2100
Fax 330.572.2101

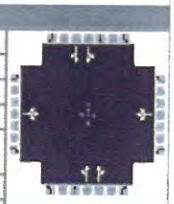
APPENDIX G
HCS INTERSECTION CAPACITY ANALYSIS

EXISTING YEAR 2012 CONDITIONS

HCS Intersection Capacity Analysis
Existing Year 2012 -- AM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Gre	Analysis Year	Existing Year 2012	Analysis Period	1> 7:00
File Name	South Green and Greenway AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	3	11	69	39	15	6	9	428	11	3	507	0

Signal Information					EB		WB			NB			SB		
Cycle, s	60.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	26.7	23.3	0.0	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		28.3		28.3		31.7		31.7
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.3		3.3		3.1		3.1
Queue Clearance Time (g_s), s		4.2		3.4		7.5		8.3
Green Extension Time (g_e), s		0.3		0.3		1.9		1.9
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		92			67		259		239	296		0
Adjusted Saturation Flow Rate (s), veh/h/ln		1637			1035		1816		1680	1854		0
Queue Service Time (g_s), s		0.0			0.0		0.0		5.5	0.0		0.0
Cycle Queue Clearance Time (g_c), s		2.2			1.4		5.4		5.5	6.3		0.0
Capacity (c), veh/h		698			501		870		747	886		
Volume-to-Capacity Ratio (X)		0.132			0.133		0.298		0.319	0.334		0.000
Available Capacity (c_a), veh/h		698			501		870		747	886		
Back of Queue (Q), veh/ln (50th percentile)		0.8			0.6		2.1		1.9	2.4		
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		11.9			11.6		10.7		10.8	11.0		
Incremental Delay (d_2), s/veh		0.4			0.6		0.9		1.1	1.0		0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.3			12.2		11.6		11.9	12.0		
Level of Service (LOS)		B			B		B		B	B		
Approach Delay, s/veh / LOS	12.3	B		12.2	B		11.7	B		12.2	B	
Intersection Delay, s/veh / LOS	12.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.6	A	0.9	A	1.0	A

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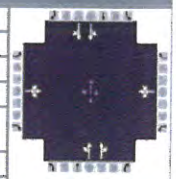
HCS Intersection Capacity Analysis
Existing Year 2012 -- PM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Gr	Analysis Year	Existing Year 2012	Analysis Period	1> 7:00
File Name	South Green and Greenway PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	9	10	16	11	4	3	5	508	7	2	589	2

Signal Information										
Cycle, s	60.0	Reference Phase	2							
Offset, s	0	Reference Point	End							
Uncoordinated	Yes	Simult. Gap E/W	On	Green	27.4	22.6	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0
				Red	2.0	2.0	0.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		27.6		27.6		32.4		32.4
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.0		3.0
Queue Clearance Time (g_s), s		2.8		2.4		8.4		9.2
Green Extension Time (g_e), s		0.1		0.1		2.3		2.3
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.01		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		39			20		302		276	345		314
Adjusted Saturation Flow Rate (s), veh/h/ln		1425			1045		1843		1687	1895		1727
Queue Service Time (g_s), s		0.0			0.0		0.0		6.4	0.0		7.2
Cycle Queue Clearance Time (g_c), s		0.8			0.4		6.3		6.4	7.2		7.2
Capacity (c), veh/h		612			490		903		770	926		789
Volume-to-Capacity Ratio (X)		0.064			0.041		0.334		0.358	0.372		0.398
Available Capacity (c_a), veh/h		612			490		903		770	926		789
Back of Queue (Q), veh/ln (50th percentile)		0.3			0.2		2.4		2.2	2.8		2.6
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		11.9			11.8		10.6		10.6	10.8		10.8
Incremental Delay (d_2), s/veh		0.2			0.2		1.0		1.3	1.1		1.5
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.1			11.9		11.6		11.9	12.0		12.3
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	12.1	B		11.9	B		11.7	B		12.1	B	
Intersection Delay, s/veh / LOS	11.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.5	A	1.0	A	1.0	A

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HCS Intersection Capacity Analysis
Existing Year 2012 -- AM Peak
South Green & Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd. and NDC Entrance
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Existing Year 2012
Analysis Time Period	AM Peak		

Project Description: *Proposed Cuyahoga County Public Library*

East/West Street: *Notre Dame College Drive* | North/South Street: *South Green Road*

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)		451	130	109	444	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	501	144	121	493	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				13		7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	14	0	7
Percent Heavy Vehicles	0	0	0	20	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT	L		R			
v (veh/h)		121	14		7			
C (m) (veh/h)		950	167		724			
v/c		0.13	0.08		0.01			
95% queue length		0.44	0.27		0.03			
Control Delay (s/veh)		9.3	28.5		10.0			
LOS		A	D		B			
Approach Delay (s/veh)	--	--	22.4					
Approach LOS	--	--	C					

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HCS Intersection Capacity Analysis
Existing Year 2012 -- PM Peak
South Green & Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd. and NDC Entrance
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Existing Year 2012
Analysis Time Period	PM Peak		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: Notre Dame College Drive | North/South Street: South Green Road

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)		597	84	54	537	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	663	93	60	596	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				75		41
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	83	0	45
Percent Heavy Vehicles	0	0	0	0	0	4
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT	L		R			
v (veh/h)		60	83		45			
C (m) (veh/h)		864	187		661			
v/c		0.07	0.44		0.07			
95% queue length		0.22	2.07		0.22			
Control Delay (s/veh)		9.5	38.8		10.8			
LOS		A	E		B			
Approach Delay (s/veh)	--	--	29.0					
Approach LOS	--	--	D					

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HCS Intersection Capacity Analysis
Existing Year 2012 –- AM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Existing Year 2012
Analysis Time Period	AM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		451	4	4	531	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	501	4	4	590	0
Percent Heavy Vehicles	0	--	--	33	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				10		50
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	11	0	55
Percent Heavy Vehicles	0	0	0	0	0	0
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)		4		66				
C (m) (veh/h)		867		638				
v/c		0.00		0.10				
95% queue length		0.01		0.34				
Control Delay (s/veh)		9.2		11.3				
LOS		A		B				
Approach Delay (s/veh)	--	--	11.3					
Approach LOS	--	--	B					

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HCS Intersection Capacity Analysis
Existing Year 2012 –- PM Peak
South Green & College Road

Two-Way Stop Control

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Existing Year 2012
Analysis Time Period	PM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		579	7	11	699	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	643	7	12	776	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				15		65
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	16	0	72
Percent Heavy Vehicles	0	0	0	0	0	0
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)		12		88				
C (m) (veh/h)		946		510				
v/c		0.01		0.17				
95% queue length		0.04		0.62				
Control Delay (s/veh)		8.9		13.5				
LOS		A		B				
Approach Delay (s/veh)	--	--	13.5					
Approach LOS	--	--	B					

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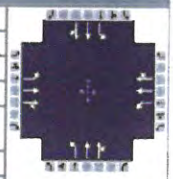
HCS Intersection Capacity Analysis
Existing Year 2012 –- AM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Existing Year 2012	Analysis Period	1> 7:00
File Name	South Green and Cedar AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	99	840	81	107	750	112	87	142	81	265	254	63

Signal Information					EB		WB				
Cycle, s	90.0	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	10.0	18.7	10.0	31.3	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	3.0	3.0	0.0	0.0	
				Red	2.0	2.0	2.0	2.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	36.3	15.0	36.3	15.0	23.7	15.0	23.7
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	5.2	24.7	5.5	23.0	5.5	8.6	12.0	9.9
Green Extension Time (g_e), s	0.1	2.8	0.1	3.2	0.0	0.9	0.0	0.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.11	0.60	0.18	0.46	0.16	0.02	1.00	0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	110	520	504	119	490	468	97	158	90	294	180	172
Adjusted Saturation Flow Rate (s), veh/h/ln	1792	1863	1805	1774	1863	1778	1792	1863	1579	1792	1863	1736
Queue Service Time (g_s), s	3.2	22.7	22.7	3.5	21.0	21.0	3.5	6.6	4.3	10.0	7.6	7.9
Cycle Queue Clearance Time (g_c), s	3.2	22.7	22.7	3.5	21.0	21.0	3.5	6.6	4.3	10.0	7.6	7.9
Capacity (c), veh/h	347	648	628	329	648	618	404	387	328	432	387	361
Volume-to-Capacity Ratio (X)	0.317	0.802	0.802	0.361	0.757	0.757	0.239	0.408	0.274	0.681	0.465	0.478
Available Capacity (c_a), veh/h	347	648	628	329	648	618	404	387	328	432	387	361
Back of Queue (Q), veh/ln (50th percentile)	1.4	11.3	11.0	1.6	10.2	9.8	1.6	3.2	1.8	5.9	3.7	3.6
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	17.0	26.6	26.6	17.8	26.0	26.0	22.4	30.9	30.0	26.4	31.3	31.4
Incremental Delay (d_2), s/veh	2.4	10.1	10.4	3.1	8.0	8.4	1.4	3.2	2.1	8.4	4.0	4.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	19.4	36.7	37.0	20.8	34.0	34.4	23.8	34.0	32.0	34.8	35.2	35.8
Level of Service (LOS)	B	D	D	C	C	C	C	C	C	C	D	D
Approach Delay, s/veh / LOS	35.1	D		32.7	C		30.6	C		35.2	D	
Intersection Delay, s/veh / LOS	33.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.4	A	1.4	A	0.8	A	1.0	A

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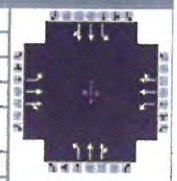
HCS Intersection Capacity Analysis
Existing Year 2012 –- PM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Existing Year 2012	Analysis Period	1> 7:00
File Name	South Green and Cedar PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	121	818	72	142	744	118	108	232	79	264	262	108

Signal Information				EB		WB		NB		SB			
Cycle, s	90.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	10.0	19.6	10.0	30.4	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	3.0	3.0	0.0	0.0			
				Red	2.0	2.0	2.0	2.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	35.4	15.0	35.4	15.0	24.6	15.0	24.6
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	6.0	24.0	6.8	23.0	6.3	9.5	12.0	11.2
Green Extension Time (g_e), s	0.1	2.7	0.1	3.0	0.1	1.2	0.0	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.34	0.60	0.91	0.52	0.48	0.05	1.00	0.10

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	134	502	487	158	491	467	120	177	168	293	213	198
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1863	1809	1792	1881	1791	1810	1900	1737	1810	1900	1713
Queue Service Time (g_s), s	4.0	22.0	22.0	4.8	21.0	21.0	4.3	7.2	7.5	10.0	8.9	9.2
Cycle Queue Clearance Time (g_c), s	4.0	22.0	22.0	4.8	21.0	21.0	4.3	7.2	7.5	10.0	8.9	9.2
Capacity (c), veh/h	343	629	611	333	635	605	395	414	378	422	414	373
Volume-to-Capacity Ratio (X)	0.392	0.797	0.797	0.474	0.772	0.772	0.304	0.429	0.445	0.695	0.514	0.532
Available Capacity (c_a), veh/h	343	629	611	333	635	605	395	414	378	422	414	373
Back of Queue (Q), veh/ln (50th percentile)	1.9	11.0	10.7	2.3	10.5	10.1	2.0	3.6	3.5	5.8	4.5	4.2
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	17.9	27.0	27.0	18.7	26.7	26.7	22.2	30.4	30.5	25.7	31.0	31.1
Incremental Delay (d_2), s/veh	3.3	10.1	10.4	4.8	8.8	9.3	2.0	3.2	3.8	9.1	4.5	5.3
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.3	37.1	37.4	23.5	35.5	36.0	24.2	33.6	34.2	34.8	35.5	36.5
Level of Service (LOS)	C	D	D	C	D	D	C	C	C	C	D	D
Approach Delay, s/veh / LOS	35.4	D		34.0	C		31.4	C		35.5	D	
Intersection Delay, s/veh / LOS	34.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.4	A	1.4	A	0.9	A	1.1	A

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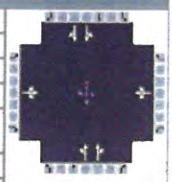
OPENING YEAR 2013 'NO-BUILD' CONDITIONS

HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - AM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0 90
Intersection	South Green Road and Gre	Analysis Year	Opening Year 2013 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	3	11	69	39	15	6	9	430	11	3	510	0

Signal Information				EB		WB		NB		SB		
Cycle, s	60.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	26.7	23.3	0.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0		
				Red	2.0	2.0	0.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		28.3		28.3		31.7		31.7
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.3		3.3		3.1		3.1
Queue Clearance Time (g_s), s		4.2		3.4		7.5		8.3
Green Extension Time (g_e), s		0.3		0.3		2.0		1.9
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		92			67		260		240	298		0
Adjusted Saturation Flow Rate (s), veh/h/ln		1605			1017		1816		1680	1854		0
Queue Service Time (g_s), s		0.0			0.0		0.0		5.5	0.0		0.0
Cycle Queue Clearance Time (g_c), s		2.2			1.4		5.4		5.5	6.3		0.0
Capacity (c), veh/h		685			494		870		747	886		
Volume-to-Capacity Ratio (X)		0.135			0.135		0.299		0.321	0.336		0.000
Available Capacity (c_a), veh/h		685			494		870		747	886		
Back of Queue (Q), veh/ln (50th percentile)		0.8			0.6		2.1		2.0	2.4		
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		11.9			11.6		10.7		10.8	11.0		
Incremental Delay (d_2), s/veh		0.4			0.6		0.9		1.1	1.0		0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.3			12.2		11.6		11.9	12.0		
Level of Service (LOS)		B			B		B		B	B		
Approach Delay, s/veh / LOS	12.3		B	12.2		B	11.8		B	12.2		B
Intersection Delay, s/veh / LOS	12.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.6	A	0.9	A	1.0	A

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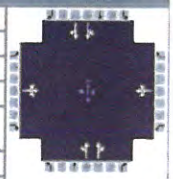
HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - PM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Gre	Analysis Year	Opening Year 2013 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	9	10	16	11	4	3	5	511	7	2	592	2

Signal Information					EB		WB				NB			SB		
Cycle, s	60.0	Reference Phase	2		L	T	L	T	R		L	T	R	L	T	R
Offset, s	0	Reference Point	End	Green	27.5	22.5	0.0	0.0	0.0		0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	0.0	0.0	0.0		0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0		0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		27.5		27.5		32.5		32.5
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.0		3.0
Queue Clearance Time (gs), s		2.9		2.4		8.4		9.4
Green Extension Time (ge), s		0.1		0.1		2.3		2.3
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.01		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		39			20		304		278	347		316
Adjusted Saturation Flow Rate (s), veh/h/ln		1397			1024		1843		1687	1858		1693
Queue Service Time (gs), s		0.0			0.0		0.0		6.4	0.0		7.4
Cycle Queue Clearance Time (gc), s		0.9			0.4		6.3		6.4	7.4		7.4
Capacity (c), veh/h		599			481		906		773	912		776
Volume-to-Capacity Ratio (X)		0.065			0.042		0.335		0.359	0.380		0.407
Available Capacity (ca), veh/h		599			481		906		773	912		776
Back of Queue (Q), veh/ln (50th percentile)		0.3			0.2		2.4		2.2	2.8		2.6
Overflow Queue (Q3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d1), s/veh		12.0			11.9		10.5		10.5	10.8		10.8
Incremental Delay (d2), s/veh		0.2			0.2		1.0		1.3	1.2		1.6
Initial Queue Delay (d3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.2			12.0		11.5		11.8	12.0		12.4
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	12.2	B		12.0	B		11.7	B		12.2	B	
Intersection Delay, s/veh / LOS	12.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.5	A	1.0	A	1.0	A

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - AM Peak
South Green & Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd. and NDC Entrance
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Opening Year 2013 'No-Build'
Analysis Time Period	AM Peak		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: Notre Dame College Entrance | North/South Street: South Green Road

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)		453	131	110	446	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	503	145	122	495	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				13		7
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	14	0	7
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	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT	L		R			
v (veh/h)		122	14		7			
C (m) (veh/h)		934	189		715			
v/c		0.13	0.07		0.01			
95% queue length		0.45	0.24		0.03			
Control Delay (s/veh)		9.4	25.6		10.1			
LOS		A	D		B			
Approach Delay (s/veh)	--	--	20.4					
Approach LOS	--	--	C					

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - PM Peak
South Green & Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd. and NDC Entrance
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Opening Year 2013 'No-Build'
Analysis Time Period	PM Peak		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: Notre Dame College Entrance | North/South Street: South Green Road

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)		600	84	54	540	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	666	93	60	600	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				75		41
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	83	0	45
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	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT	L		R			
v (veh/h)		60	83		45			
C (m) (veh/h)		848	183		665			
v/c		0.07	0.45		0.07			
95% queue length		0.23	2.13		0.22			
Control Delay (s/veh)		9.6	40.0		10.8			
LOS		A	E		B			
Approach Delay (s/veh)	--	--	29.8					
Approach LOS	--	--	D					

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - AM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Opening Year 2013 'No-Build'
Analysis Time Period	AM Peak Hour		

Project Description: *Proposed Cuyahoga County Public Library*

East/West Street: *College Road* | North/South Street: *South Green Road*

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)		453	4	4	534	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	503	4	4	593	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				10		50
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	11	0	55
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)		4		66				
C (m) (veh/h)		1054		629				
v/c		0.00		0.10				
95% queue length		0.01		0.35				
Control Delay (s/veh)		8.4		11.4				
LOS		A		B				
Approach Delay (s/veh)	--	--	11.4					
Approach LOS	--	--	B					

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - PM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Opening Year 2013 'No-Build'
Analysis Time Period	PM Peak Hour		

Project Description: *Proposed Cuyahoga County Public Library*

East/West Street: *College Road* | North/South Street: *South Green Road*

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)		582	7	11	702	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	646	7	12	780	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				15		65
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	16	0	72
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)		12		88				
C (m) (veh/h)		930		502				
v/c		0.01		0.18				
95% queue length		0.04		0.63				
Control Delay (s/veh)		8.9		13.7				
LOS		A		B				
Approach Delay (s/veh)	--	--	13.7					
Approach LOS	--	--	B					

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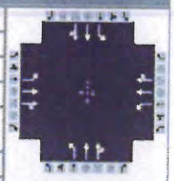
HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - AM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Opening Year 2013 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	99	844	81	108	754	113	87	143	81	266	255	63

Signal Information					EB		WB		NB		SB	
Cycle, s	90.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	10.0	18.7	10.0	31.3	0.0	0.0		
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	3.0	3.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	2.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	36.3	15.0	36.3	15.0	23.7	15.0	23.7
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	5.2	24.9	5.5	23.1	5.5	8.6	12.0	9.9
Green Extension Time (g_e), s	0.1	2.8	0.1	3.2	0.0	0.9	0.0	0.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.12	0.61	0.19	0.48	0.16	0.02	1.00	0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	110	522	506	120	493	470	97	159	90	296	180	173
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1805	1774	1863	1777	1774	1863	1579	1774	1863	1736
Queue Service Time (g_s), s	3.2	22.9	22.9	3.5	21.1	21.1	3.5	6.6	4.3	10.0	7.6	7.9
Cycle Queue Clearance Time (g_c), s	3.2	22.9	22.9	3.5	21.1	21.1	3.5	6.6	4.3	10.0	7.6	7.9
Capacity (c), veh/h	343	648	628	328	648	618	400	387	328	428	387	361
Volume-to-Capacity Ratio (X)	0.321	0.806	0.806	0.365	0.761	0.761	0.242	0.411	0.274	0.691	0.466	0.479
Available Capacity (c_a), veh/h	343	648	628	328	648	618	400	387	328	428	387	361
Back of Queue (Q), veh/ln (50th percentile)	1.4	11.4	11.1	1.6	10.3	9.9	1.6	3.2	1.8	6.0	3.8	3.7
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	17.1	26.6	26.6	17.9	26.0	26.0	22.5	30.9	30.0	26.6	31.3	31.4
Incremental Delay (d_2), s/veh	2.5	10.3	10.6	3.1	8.2	8.6	1.4	3.2	2.1	8.8	4.0	4.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	19.6	36.9	37.2	21.0	34.2	34.6	23.9	34.1	32.0	35.5	35.3	35.9
Level of Service (LOS)	B	D	D	C	C	C	C	C	C	D	D	D
Approach Delay, s/veh / LOS	35.4	D		32.9	C		30.7	C		35.5	D	
Intersection Delay, s/veh / LOS	34.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.4	A	1.4	A	0.8	A	1.0	A

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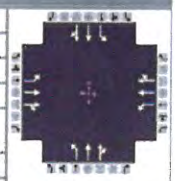
HCS Intersection Capacity Analysis
Opening Year 2013 - 'No-Build' - PM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Opening Year 2013 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	122	822	72	143	748	119	109	233	79	265	263	109

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	19.8	10.0	30.2	0.0	0.0		
Yellow	3.0	3.0	3.0	3.0	0.0	0.0		
Red	2.0	2.0	2.0	2.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	35.2	15.0	35.2	15.0	24.8	15.0	24.8
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	6.0	24.2	6.9	23.6	6.4	9.7	12.0	11.5
Green Extension Time (g_e), s	0.1	2.6	0.1	2.8	0.1	1.2	0.0	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.37	0.64	1.00	0.59	0.56	0.04	1.00	0.10

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	136	504	489	159	494	470	121	178	169	294	214	199
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1863	1810	1774	1863	1773	1774	1863	1703	1774	1863	1679
Queue Service Time (g_s), s	4.0	22.2	22.2	4.9	21.6	21.6	4.4	7.4	7.7	10.0	9.1	9.5
Cycle Queue Clearance Time (g_c), s	4.0	22.2	22.2	4.9	21.6	21.6	4.4	7.4	7.7	10.0	9.1	9.5
Capacity (c), veh/h	338	625	607	327	625	595	388	410	375	415	410	369
Volume-to-Capacity Ratio (X)	0.401	0.806	0.806	0.485	0.790	0.790	0.312	0.434	0.450	0.709	0.522	0.540
Available Capacity (c_a), veh/h	338	625	607	327	625	595	388	410	375	415	410	369
Back of Queue (Q), veh/ln (50th percentile)	1.9	11.2	10.9	2.3	10.8	10.3	2.0	3.6	3.5	5.9	4.5	4.3
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	18.2	27.2	27.2	18.9	27.0	27.0	22.2	30.3	30.4	25.9	30.9	31.1
Incremental Delay (d_2), s/veh	3.5	10.7	11.0	5.1	9.8	10.2	2.1	3.3	3.9	9.8	4.7	5.6
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.8	37.9	38.2	24.0	36.8	37.3	24.3	33.6	34.3	35.7	35.6	36.6
Level of Service (LOS)	C	D	D	C	D	D	C	C	C	D	D	D
Approach Delay, s/veh / LOS	36.1	D		35.2	D		31.4	C		36.0	D	
Intersection Delay, s/veh / LOS	35.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.4	A	1.4	A	0.9	A	1.1	A

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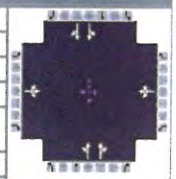
DESIGN YEAR 2033 'NO-BUILD' CONDITIONS

HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - AM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Gre	Analysis Year	Design Year 2033 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	3	12	76	43	17	7	10	473	12	3	560	0

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	26.8	23.2		0.0	0.0	0.0	0.0					
Yellow	3.0	3.0		0.0	0.0	0.0	0.0					
Red	2.0	2.0		0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		28.2		28.2		31.8		31.8
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.3		3.3		3.1		3.1
Queue Clearance Time (g_s), s		4.5		3.6		8.2		9.1
Green Extension Time (g_e), s		0.3		0.3		2.2		2.2
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.01		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		101			74		286		264	327		0
Adjusted Saturation Flow Rate (s), veh/h/ln		1605			1027		1810		1680	1855		0
Queue Service Time (g_s), s		0.0			0.0		0.0		6.2	0.0		0.0
Cycle Queue Clearance Time (g_c), s		2.5			1.6		6.0		6.2	7.1		0.0
Capacity (c), veh/h		683			496		871		750	889		
Volume-to-Capacity Ratio (X)		0.148			0.150		0.328		0.352	0.368		0.000
Available Capacity (c_a), veh/h		683			496		871		750	889		
Back of Queue (Q), veh/ln (50th percentile)		0.9			0.6		2.3		2.2	2.7		
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		12.0			11.8		10.8		10.9	11.1		
Incremental Delay (d_2), s/veh		0.5			0.6		1.0		1.3	1.2		0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.5			12.4		11.9		12.2	12.3		
Level of Service (LOS)		B			B		B		B	B		
Approach Delay, s/veh / LOS	12.5	B		12.4	B		12.0	B		12.5	B	
Intersection Delay, s/veh / LOS	12.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.7	A	0.6	A	0.9	A	1.0	A

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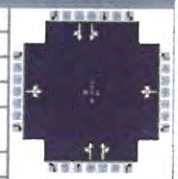
HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - PM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Gre	Analysis Year	Design Year 2033 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	11	18	12	4	3	6	561	8	2	651	2

Signal Information					EB		WB				NB			SB		
Cycle, s	60.0	Reference Phase	2		L	T	R	L	T	R	L	T	R	L	T	R
Offset, s	0	Reference Point	End	Green	27.9	22.1	0.0	0.0	0.0	0.0						
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0						
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		27.1		27.1		32.9		32.9
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.0		3.0
Queue Clearance Time (g_s), s		3.0		2.4		9.1		10.3
Green Extension Time (g_e), s		0.1		0.1		2.6		2.6
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.02		0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		43			21		333		306	381		347
Adjusted Saturation Flow Rate (s), veh/h/ln		1399			1006		1839		1686	1858		1693
Queue Service Time (g_s), s		0.0			0.0		0.0		7.1	0.0		8.3
Cycle Queue Clearance Time (g_c), s		1.0			0.4		7.0		7.1	8.2		8.3
Capacity (c), veh/h		591			468		916		784	925		787
Volume-to-Capacity Ratio (X)		0.073			0.045		0.364		0.390	0.412		0.441
Available Capacity (c_a), veh/h		591			468		916		784	925		787
Back of Queue (Q), veh/ln (50th percentile)		0.4			0.2		2.6		2.5	3.1		2.9
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		12.3			12.1		10.5		10.5	10.8		10.8
Incremental Delay (d_2), s/veh		0.2			0.2		1.1		1.5	1.4		1.8
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.5			12.3		11.6		11.9	12.2		12.6
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	12.5	B		12.3	B		11.8	B		12.4	B	
Intersection Delay, s/veh / LOS	12.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.5	A	1.0	A	1.1	A

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HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - AM Peak
South Green & Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd. and NDC Entrance
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Design Year 2033 'No-Build'
Analysis Time Period	AM Peak		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: Notre Dame College Entrance | North/South Street: South Green Road

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)		498	144	120	491	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	553	160	133	545	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				14		8
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	15	0	8
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	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT	L		R			
v (veh/h)		133	15		8			
C (m) (veh/h)		883	158		686			
v/c		0.15	0.09		0.01			
95% queue length		0.53	0.31		0.04			
Control Delay (s/veh)		9.8	30.2		10.3			
LOS		A	D		B			
Approach Delay (s/veh)	--	--	23.3					
Approach LOS	--	--	C					

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HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - PM Peak
South Green & Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	CJD
Agency/Co.	GPD Group
Date Performed	8/27/2012
Analysis Time Period	PM Peak

Site Information

Intersection	S Green Rd. and NDC Entrance
Jurisdiction	South Euclid, OH
Analysis Year	Design Year 2033 'No-Build'

Project Description: Proposed Cuyahoga County Public Library

East/West Street: Notre Dame College Entrance | North/South Street: South Green Road

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)		660	93	60	593	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	733	103	66	658	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				83		45
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	92	0	50
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	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT	L		R			
v (veh/h)		66	92		50			
C (m) (veh/h)		794	152		633			
v/c		0.08	0.61		0.08			
95% queue length		0.27	3.22		0.26			
Control Delay (s/veh)		9.9	59.6		11.2			
LOS		A	F		B			
Approach Delay (s/veh)	--	--	42.6					
Approach LOS	--	--	E					

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HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - AM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Design Year 2033 'No-Build'
Analysis Time Period	AM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		498	4	4	587	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	553	4	4	652	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				11		55
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	12	0	61
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)		4		73				
C (m) (veh/h)		1010		594				
v/c		0.00		0.12				
95% queue length		0.01		0.42				
Control Delay (s/veh)		8.6		11.9				
LOS		A		B				
Approach Delay (s/veh)	--	--	11.9					
Approach LOS	--	--	B					

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HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - PM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CJD	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	8/27/2012	Analysis Year	Design Year 2033 'No-Build'
Analysis Time Period	PM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		640	8	12	772	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	711	8	13	857	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				17		72
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	18	0	80
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)		13		98				
C (m) (veh/h)		878		455				
v/c		0.01		0.22				
95% queue length		0.05		0.81				
Control Delay (s/veh)		9.2		15.1				
LOS		A		C				
Approach Delay (s/veh)	--	--	15.1					
Approach LOS	--	--	C					

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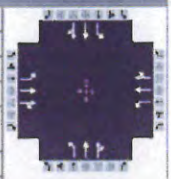
HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - AM Peak
South Green & Cedar Road

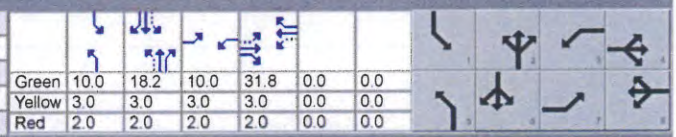
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Design Year 2033 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	109	928	90	118	829	124	96	157	90	293	281	70

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	10.0	18.2	10.0	31.8	0.0	0.0		
Yellow	3.0	3.0	3.0	3.0	0.0	0.0		
Red	2.0	2.0	2.0	2.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	36.8	15.0	36.8	15.0	23.2	15.0	23.2
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	5.5	28.0	5.8	25.9	6.0	9.4	12.0	10.9
Green Extension Time (g_e), s	0.1	2.1	0.1	2.9	0.1	1.0	0.0	0.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.19	0.91	0.29	0.71	0.30	0.06	1.00	0.12

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	121	574	557	131	542	517	107	174	100	326	199	191
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1804	1774	1863	1778	1774	1863	1579	1774	1863	1735
Queue Service Time (g_s), s	3.5	25.9	26.0	3.8	23.9	23.9	4.0	7.4	4.9	10.0	8.6	8.9
Cycle Queue Clearance Time (g_c), s	3.5	25.9	26.0	3.8	23.9	23.9	4.0	7.4	4.9	10.0	8.6	8.9
Capacity (c), veh/h	324	658	638	309	658	628	380	377	319	409	377	351
Volume-to-Capacity Ratio (X)	0.374	0.873	0.873	0.424	0.823	0.823	0.281	0.463	0.313	0.796	0.530	0.543
Available Capacity (c_a), veh/h	324	658	638	309	658	628	380	377	319	409	377	351
Back of Queue (Q), veh/ln (50th percentile)	1.6	13.6	13.2	1.8	12.0	11.5	1.8	3.7	2.0	3.4	4.3	4.2
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	18.0	27.2	27.2	18.8	26.5	26.5	23.1	31.6	30.6	28.8	32.1	32.2
Incremental Delay (d_2), s/veh	3.3	14.9	15.3	4.2	11.2	11.7	1.8	4.1	2.6	14.8	5.2	5.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.2	42.1	42.6	23.1	37.7	38.2	24.9	35.7	33.1	43.6	37.3	38.1
Level of Service (LOS)	C	D	D	C	D	D	C	D	C	D	D	D
Approach Delay, s/veh / LOS	40.3	D		36.3	D		32.0	C		40.4	D	
Intersection Delay, s/veh / LOS	38.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.5	A	0.8	A	1.1	A

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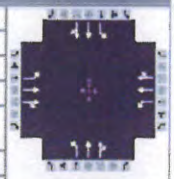
HCS Intersection Capacity Analysis
Design Year 2033 - 'No-Build' - PM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

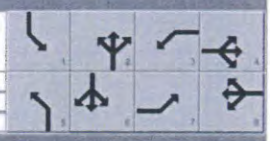
General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	CJD	Analysis Date	Aug 27, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Design Year 2033 'No-Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	134	904	80	157	822	130	119	256	87	292	290	119

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	19.4	10.0	30.6	0.0	0.0	
Yellow	3.0	3.0	3.0	3.0	0.0	0.0	
Red	2.0	2.0	2.0	2.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	35.6	15.0	35.6	15.0	24.4	15.0	24.4
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	6.5	27.2	7.4	26.4	6.9	10.6	12.0	12.6
Green Extension Time (g_e), s	0.1	1.9	0.1	2.3	0.1	1.3	0.0	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.67	0.96	1.00	0.86	1.00	0.10	1.00	0.22

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	149	555	539	174	542	516	132	196	185	324	236	219
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1809	1774	1863	1773	1774	1863	1703	1774	1863	1680
Queue Service Time (g_s), s	4.5	25.2	25.2	5.4	24.4	24.4	4.9	8.3	8.6	10.0	10.2	10.6
Cycle Queue Clearance Time (g_c), s	4.5	25.2	25.2	5.4	24.4	24.4	4.9	8.3	8.6	10.0	10.2	10.6
Capacity (c), veh/h	314	633	615	308	633	603	369	402	367	397	402	362
Volume-to-Capacity Ratio (X)	0.474	0.876	0.876	0.566	0.855	0.856	0.359	0.488	0.504	0.818	0.587	0.604
Available Capacity (c_a), veh/h	314	633	615	308	633	603	369	402	367	397	402	362
Back of Queue (Q), veh/ln (50th percentile)	2.2	13.3	13.0	2.7	12.7	12.2	2.2	4.1	3.9	3.6	5.1	4.9
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	19.2	27.9	27.9	19.8	27.6	27.6	22.8	30.9	31.1	28.2	31.7	31.8
Incremental Delay (d_2), s/veh	5.1	15.6	16.1	7.4	13.9	14.5	2.7	4.2	4.9	16.9	6.2	7.3
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	24.3	43.5	44.0	27.1	41.5	42.1	25.5	35.1	35.9	45.1	37.9	39.1
Level of Service (LOS)	C	D	D	C	D	D	C	D	D	D	D	D
Approach Delay, s/veh / LOS	41.4	D		39.7	D		32.9	C		41.2	D	
Intersection Delay, s/veh / LOS	39.7						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.5	A	0.9	A	1.1	A

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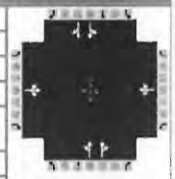
OPENING YEAR 2013 'BUILD' CONDITIONS

HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - AM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	Sep 14, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Gre	Analysis Year	Opening Year 2013 'Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	3	11	72	39	15	6	10	436	11	3	524	0

Signal Information										
Cycle, s	60.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	26.7	23.3	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		28.3		28.3		31.7		31.7
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.3		3.3		3.1		3.1
Queue Clearance Time (gs), s		4.3		3.4		7.7		8.5
Green Extension Time (ge), s		0.3		0.3		2.0		2.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.01		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		96			67		264		244	306		0
Adjusted Saturation Flow Rate (s), veh/h/ln		1604			1019		1808		1680	1854		0
Queue Service Time (gs), s		0.0			0.0		0.0		5.7	0.0		0.0
Cycle Queue Clearance Time (gc), s		2.3			1.4		5.5		5.7	6.5		0.0
Capacity (c), veh/h		685			495		867		748	886		
Volume-to-Capacity Ratio (X)		0.140			0.135		0.304		0.326	0.345		0.000
Available Capacity (ca), veh/h		685			495		867		748	886		
Back of Queue (Q), veh/ln (50th percentile)		0.8			0.6		2.1		2.0	2.5		
Overflow Queue (Q3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d1), s/veh		11.9			11.6		10.8		10.8	11.1		
Incremental Delay (d2), s/veh		0.4			0.6		0.9		1.2	1.1		0.0
Initial Queue Delay (d3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.4			12.2		11.7		12.0	12.1		
Level of Service (LOS)		B			B		B		B	B		
Approach Delay, s/veh / LOS	12.4	B		12.2	B		11.8	B		12.3	B	
Intersection Delay, s/veh / LOS	12.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.6	A	0.9	A	1.0	A

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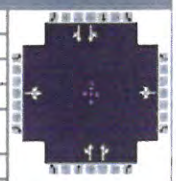
HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - PM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	Sep 14, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green and Greenwa	Analysis Year	Opening Year 2013 'Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	9	10	26	11	4	3	15	575	7	2	651	2

Signal Information					EB		WB		NB		SB	
Cycle, s	60.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	27.8	22.2	0.0	0.0	0.0	0.0		
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		27.2		27.2		32.8		32.8
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.1		3.1
Queue Clearance Time (gs), s		3.2		2.4		9.6		10.3
Green Extension Time (ge), s		0.1		0.1		2.7		2.7
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.02		0.03

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		50			20		341		322	381		347
Adjusted Saturation Flow Rate (s), veh/h/ln		1458			1020		1778		1688	1858		1693
Queue Service Time (gs), s		0.0			0.0		0.0		7.6	0.0		8.3
Cycle Queue Clearance Time (gc), s		1.2			0.4		7.2		7.6	8.3		8.3
Capacity (c), veh/h		611			474		887		782	921		784
Volume-to-Capacity Ratio (X)		0.082			0.042		0.384		0.412	0.413		0.442
Available Capacity (cm), veh/h		611			474		887		782	921		784
Back of Queue (Q), veh/ln (50th percentile)		0.4			0.2		2.7		2.7	3.1		2.9
Overflow Queue (Q3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d1), s/veh		12.3			12.0		10.6		10.7	10.9		10.9
Incremental Delay (d2), s/veh		0.3			0.2		1.3		1.6	1.4		1.8
Initial Queue Delay (d3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.5			12.2		11.8		12.3	12.2		12.7
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	12.5	B		12.2	B		12.1	B		12.4	B	
Intersection Delay, s/veh / LOS	12.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.5	A	1.0	A	1.1	A

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - AM Peak
South Green & Library Drive / Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SGM	Intersection	S Green Rd and Drive 1/NDC
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	01/15/2013	Analysis Year	Opening Year 2013 'Build'
Analysis Time Period	AM Peak Hour		

Project Description: *Proposed Cuyahoga County Public Library*

East/West Street: *Library Drive and NDC Entrance* | North/South Street: *South Green Road*

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)	7	453	131	110	446	17
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	7	503	145	122	495	18
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	7	0	3	13	0	7
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	7	0	3	14	0	7
Percent Heavy Vehicles	2	2	2	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration		LTR		L		TR

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	LT	L		TR		LTR	
v (veh/h)	7	122	14		7		10	
C (m) (veh/h)	1049	934	153		715		223	
v/c	0.01	0.13	0.09		0.01		0.04	
95% queue length	0.02	0.45	0.30		0.03		0.14	
Control Delay (s/veh)	8.5	9.4	30.9		10.1		21.9	
LOS	A	A	D		B		C	
Approach Delay (s/veh)	--	--	24.0			21.9		
Approach LOS	--	--	C			C		

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - PM Peak
South Green & Library Drive / Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DTP	Intersection	S Green Rd and Drive #1 and ND
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	10/15/2013	Analysis Year	Opening Year 2013 'Build'
Analysis Time Period	PM Peak Hour		

Project Description: *Proposed Cuyahoga County Public Library*

East/West Street: *Library Drive and NDC Entrance* | North/South Street: *South Green Road*

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)	29	600	84	54	540	69
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	32	666	93	60	600	76
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	74	0	32	75	0	41
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	82	0	35	83	0	45
Percent Heavy Vehicles	2	2	2	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration		LTR		L		TR

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	LT	L		TR		LTR	
v (veh/h)	32	60	83		45		117	
C (m) (veh/h)	911	848	124		665		172	
v/c	0.04	0.07	0.67		0.07		0.68	
95% queue length	0.11	0.23	3.58		0.22		4.03	
Control Delay (s/veh)	9.1	9.6	79.1		10.8		61.6	
LOS	A	A	F		B		F	
Approach Delay (s/veh)	--	--	55.1			61.6		
Approach LOS	--	--	F			F		

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - AM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DTP	Intersection	South Green and Cedar Road
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	9/14/2012	Analysis Year	Opening Year 2013 'Build'
Analysis Time Period	AM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		460	4	4	537	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	511	4	4	596	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				10		50
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	11	0	55
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)		4		66				
C (m) (veh/h)		1047		624				
v/c		0.00		0.11				
95% queue length		0.01		0.35				
Control Delay (s/veh)		8.5		11.5				
LOS		A		B				
Approach Delay (s/veh)	--	--	11.5					
Approach LOS	--	--	B					

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HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - PM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY			
General Information		**Site Information**	
Analyst	DTP	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	9/14/2012	Analysis Year	Opening Year 2013 'Build'
Analysis Time Period	PM Peak Hour		
Project Description	Proposed Cuyahoga County Public Library		
East/West Street:	College Road	North/South Street:	South Green Road
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)		611	7	11	734	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	678	7	12	815	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				15		65
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	16	0	72
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)		12		88				
C (m) (veh/h)		904		481				
v/c		0.01		0.18				
95% queue length		0.04		0.66				
Control Delay (s/veh)		9.0		14.2				
LOS		A		B				
Approach Delay (s/veh)	--	--	14.2					
Approach LOS	--	--	B					

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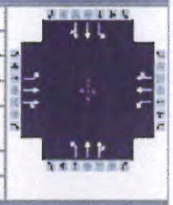
HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - AM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	9/14/2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Opening Year 2013 'Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	101	844	81	108	754	115	87	146	81	267	256	64

Signal Information					EB		WB			NB			SB		
Cycle, s	90.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	10.0	18.8	10.0	31.2	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	3.0	3.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	2.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	36.2	15.0	36.2	15.0	23.8	15.0	23.8
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	5.3	24.9	5.5	23.2	5.5	8.8	12.0	9.9
Green Extension Time (g_e), s	0.1	2.8	0.1	3.2	0.0	0.9	0.0	0.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.13	0.63	0.19	0.49	0.16	0.03	1.00	0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	112	522	506	120	494	471	97	162	90	297	182	174
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1805	1774	1863	1776	1774	1863	1579	1774	1863	1735
Queue Service Time (g_s), s	3.3	22.9	22.9	3.5	21.2	21.2	3.5	6.8	4.3	10.0	7.7	7.9
Cycle Queue Clearance Time (g_c), s	3.3	22.9	22.9	3.5	21.2	21.2	3.5	6.8	4.3	10.0	7.7	7.9
Capacity (c), veh/h	341	646	626	328	646	616	400	389	330	427	389	362
Volume-to-Capacity Ratio (X)	0.329	0.808	0.808	0.366	0.765	0.765	0.241	0.417	0.273	0.695	0.467	0.480
Available Capacity (c_a), veh/h	341	646	626	328	646	616	400	389	330	427	389	362
Back of Queue (Q), veh/ln (50th percentile)	1.5	11.5	11.2	1.6	10.4	10.0	1.6	3.3	1.8	1.9	3.8	3.7
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	17.2	26.7	26.7	17.9	26.1	26.1	22.4	30.9	29.9	26.6	31.2	31.3
Incremental Delay (d_2), s/veh	2.6	10.5	10.8	3.1	8.4	8.8	1.4	3.3	2.0	9.0	4.0	4.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	19.8	37.2	37.5	21.1	34.6	35.0	23.8	34.1	31.9	35.6	35.2	35.8
Level of Service (LOS)	B	D	D	C	C	C	C	C	C	D	D	D
Approach Delay, s/veh / LOS	35.6	D		33.2	C		30.7	C		35.6	D	
Intersection Delay, s/veh / LOS	34.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.4	A	1.4	A	0.8	A	1.0	A

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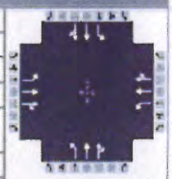
HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build' - PM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	9/14/2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green and Cedar Rc	Analysis Year	Opening Year 2013 'Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	131	822	72	143	748	129	109	243	79	276	274	119

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	20.1	10.0	29.9	0.0	0.0	
Yellow	3.0	3.0	3.0	3.0	0.0	0.0	
Red	2.0	2.0	2.0	2.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	34.9	15.0	34.9	15.0	25.1	15.0	25.1
Change Period, $(Y+R_c)$, s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	6.5	24.3	6.9	24.1	6.4	9.9	12.0	12.0
Green Extension Time (g_e), s	0.1	2.5	0.1	2.6	0.1	1.3	0.0	1.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.63	0.69	1.00	0.66	0.55	0.05	1.00	0.12

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	146	504	489	159	500	474	121	184	174	307	227	210
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1810	1774	1863	1767	1774	1863	1708	1774	1863	1673
Queue Service Time (g_s), s	4.5	22.3	22.3	4.9	22.1	22.1	4.4	7.6	7.9	10.0	9.7	10.0
Cycle Queue Clearance Time (g_c), s	4.5	22.3	22.3	4.9	22.1	22.1	4.4	7.6	7.9	10.0	9.7	10.0
Capacity (c), veh/h	327	619	601	325	619	587	383	416	381	415	416	374
Volume-to-Capacity Ratio (X)	0.445	0.814	0.814	0.489	0.808	0.808	0.316	0.441	0.457	0.739	0.545	0.562
Available Capacity (c_a), veh/h	327	619	601	325	619	587	383	416	381	415	416	374
Back of Queue (Q), veh/ln (50th percentile)	2.1	11.3	11.0	2.5	11.2	10.7	2.0	3.7	3.6	2.4	4.8	4.5
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	18.8	27.5	27.5	19.1	27.4	27.4	22.0	30.1	30.2	26.3	30.9	31.0
Incremental Delay (d_2), s/veh	4.3	11.2	11.5	5.2	10.9	11.4	2.2	3.4	3.9	11.2	5.1	6.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	23.1	38.7	39.0	24.3	38.3	38.8	24.2	33.5	34.1	37.5	36.0	37.0
Level of Service (LOS)	C	D	D	C	D	D	C	C	C	D	D	D
Approach Delay, s/veh / LOS	36.9	D		36.6	D		31.4	C		36.9	D	
Intersection Delay, s/veh / LOS	36.0						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.4	A	1.4	A	0.9	A	1.1	A

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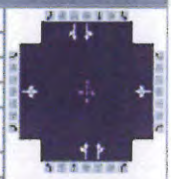
DESIGN YEAR 2033 'BUILD' CONDITIONS

HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - AM Peak
South Green & Greenway / Golfway Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	Sep 14, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Gre	Analysis Year	Design Year 2033 'Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	3	12	79	43	17	7	11	479	12	3	574	0

Signal Information									
Cycle, s	60.0	Reference Phase	2						
Offset, s	0	Reference Point	End						
Uncoordinated	Yes	Simult. Gap E/W	On	Green	26.9	23.1	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0
				Red	2.0	2.0	0.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		28.1		28.1		31.9		31.9
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.3		3.3		3.1		3.1
Queue Clearance Time (g_s), s		4.5		3.6		8.3		9.3
Green Extension Time (g_e), s		0.3		0.3		2.2		2.2
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.01		0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		104			74		289		269	335		0
Adjusted Saturation Flow Rate (s), veh/h/ln		1604			1030		1803		1680	1855		0
Queue Service Time (g_s), s		0.0			0.0		0.0		6.3	0.0		0.0
Cycle Queue Clearance Time (g_c), s		2.5			1.6		6.1		6.3	7.3		0.0
Capacity (c), veh/h		679			495		871		753	892		
Volume-to-Capacity Ratio (X)		0.154			0.150		0.332		0.356	0.376		0.000
Available Capacity (c_a), veh/h		679			495		871		753	892		
Back of Queue (Q), veh/ln (50th percentile)		0.9			0.6		2.3		2.2	2.8		
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		12.1			11.8		10.8		10.9	11.1		
Incremental Delay (d_2), s/veh		0.5			0.6		1.0		1.3	1.2		0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.6			12.5		11.8		12.2	12.3		
Level of Service (LOS)		B			B		B		B	B		
Approach Delay, s/veh / LOS	12.6	B		12.5	B		12.0	B		12.5	B	
Intersection Delay, s/veh / LOS	12.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.7	A	0.6	A	0.9	A	1.0	A

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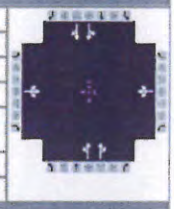
HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - PM Peak
South Green & Greenway / Golfway Road

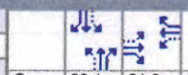
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	Sep 14, 2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green and Greenwa	Analysis Year	Design Year 2033 'Build'	Analysis Period	1> 7:00
File Name	South Green and Greenway PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	11	28	12	4	3	16	625	8	2	710	2

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB		WB			NB			SB		
Green	28.1	21.9	0.0	0.0	0.0	0.0					
Yellow	3.0	3.0	0.0	0.0	0.0	0.0					
Red	2.0	2.0	0.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		26.9		26.9		33.1		33.1
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.1		3.1
Queue Clearance Time (g_s), s		3.3		2.4		10.4		11.2
Green Extension Time (g_e), s		0.1		0.1		3.0		3.0
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.04		0.05

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		54			21		370		351	415		378
Adjusted Saturation Flow Rate (s), veh/h/ln		1454			1006		1772		1687	1859		1693
Queue Service Time (g_s), s		0.0			0.0		0.0		8.4	0.0		9.2
Cycle Queue Clearance Time (g_c), s		1.3			0.4		7.9		8.4	9.1		9.2
Capacity (c), veh/h		603			465		893		790	931		793
Volume-to-Capacity Ratio (X)		0.090			0.045		0.414		0.444	0.446		0.477
Available Capacity (c_a), veh/h		603			465		893		790	931		793
Back of Queue (Q), veh/ln (50th percentile)		0.5			0.2		3.0		3.0	3.5		3.3
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		12.5			12.2		10.6		10.7	10.9		10.9
Incremental Delay (d_2), s/veh		0.3			0.2		1.4		1.8	1.5		2.1
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		12.8			12.4		12.0		12.5	12.5		13.0
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	12.8		B	12.4		B	12.3		B	12.7		B
Intersection Delay, s/veh / LOS	12.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.6	A	0.5	A	1.1	A	1.1	A

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HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - AM Peak
South Green & Library Drive / Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SGM	Intersection	S Green Rd and Drive 1/NDC
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	01/15/2013	Analysis Year	Design Year 2033 'Build'
Analysis Time Period	AM Peak Hour		

Project Description	Proposed Cuyahoga County Public Library
East/West Street:	Library Drive and NDC Entrance
North/South Street:	South Green Road
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)	7	498	144	120	491	17
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	7	553	160	133	545	18
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	7	0	3	14	0	8
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	7	0	3	15	0	8
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration		LTR		L		TR

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	LT	L		TR		LTR	
v (veh/h)	7	133	15		8		10	
C (m) (veh/h)	1005	883	126		686		189	
v/c	0.01	0.15	0.12		0.01		0.05	
95% queue length	0.02	0.53	0.39		0.04		0.17	
Control Delay (s/veh)	8.6	9.8	37.4		10.3		25.1	
LOS	A	A	E		B		D	
Approach Delay (s/veh)	--	--	28.0			25.1		
Approach LOS	--	--	D			D		

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HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - PM Peak
South Green & Library Drive / Notre Dame College Drive

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SGM	Intersection	S Green Rd and Drive #1 and ND
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	1/15/2013	Analysis Year	Design Year 2033 'Build'
Analysis Time Period	PM Peak Hour		

Project Description: *Proposed Cuyahoga County Public Library*
East/West Street: *Library Drive and NDC Entrance* | North/South Street: *South Green Road*
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)	29	660	93	60	593	69
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	32	733	103	66	658	76
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	74	0	32	83	0	45
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	82	0	35	92	0	50
Percent Heavy Vehicles	2	2	2	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration		LTR		L		TR

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	LT	L		TR		LTR	
v (veh/h)	32	66	92		50		117	
C (m) (veh/h)	867	794	101		633		143	
v/c	0.04	0.08	0.91		0.08		0.82	
95% queue length	0.11	0.27	5.34		0.26		5.20	
Control Delay (s/veh)	9.3	9.9	143.1		11.2		93.9	
LOS	A	A	F		B		F	
Approach Delay (s/veh)	--	--	96.7			93.9		
Approach LOS	--	--	F			F		

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HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - AM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DTP	Intersection	South Green and Cedar Road
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	9/14/2012	Analysis Year	Design Year 2033 'Build'
Analysis Time Period	AM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		505	4	4	590	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	561	4	4	655	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				11		55
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	12	0	61
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)		4		73				
C (m) (veh/h)		1003		589				
v/c		0.00		0.12				
95% queue length		0.01		0.42				
Control Delay (s/veh)		8.6		12.0				
LOS		A		B				
Approach Delay (s/veh)	--	--	12.0					
Approach LOS	--	--	B					

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HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - PM Peak
South Green & College Road

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DTP	Intersection	S Green Rd and College Rd
Agency/Co.	GPD Group	Jurisdiction	South Euclid, OH
Date Performed	9/14/2012	Analysis Year	Design Year 2033 'Build'
Analysis Time Period	PM Peak Hour		

Project Description: Proposed Cuyahoga County Public Library

East/West Street: College Road | North/South Street: South Green Road

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)		669	8	12	804	
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.90	0.90	1.00
Hourly Flow Rate, HFR (veh/h)	0	743	8	13	893	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				17		72
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.90	1.00	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	18	0	80
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)		13		98				
C (m) (veh/h)		854		435				
v/c		0.02		0.23				
95% queue length		0.05		0.86				
Control Delay (s/veh)		9.3		15.7				
LOS		A		C				
Approach Delay (s/veh)	--	--	15.7					
Approach LOS	--	--	C					

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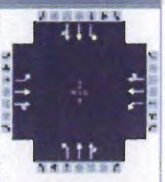
HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - AM Peak
South Green & Cedar Road

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	9/14/2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Ce	Analysis Year	Design Year 2033 'Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	111	928	90	118	829	126	96	160	90	294	282	71

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	18.3	10.0	31.7	0.0	0.0	
Yellow	3.0	3.0	3.0	3.0	0.0	0.0	
Red	2.0	2.0	2.0	2.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	36.7	15.0	36.7	15.0	23.3	15.0	23.3
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	5.6	28.0	5.9	26.0	5.9	9.6	12.0	10.9
Green Extension Time (g_e), s	0.1	2.1	0.1	2.9	0.1	1.0	0.0	0.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.21	0.93	0.29	0.73	0.30	0.06	1.00	0.12

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	123	574	557	131	543	518	107	178	100	327	201	192
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1804	1774	1863	1776	1774	1863	1579	1774	1863	1734
Queue Service Time (g_s), s	3.6	26.0	26.0	3.9	24.0	24.0	3.9	7.6	4.8	10.0	8.7	8.9
Cycle Queue Clearance Time (g_c), s	3.6	26.0	26.0	3.9	24.0	24.0	3.9	7.6	4.8	10.0	8.7	8.9
Capacity (c), veh/h	322	656	636	308	656	626	380	379	321	408	379	353
Volume-to-Capacity Ratio (X)	0.383	0.875	0.876	0.425	0.828	0.828	0.281	0.469	0.312	0.801	0.530	0.543
Available Capacity (c_a), veh/h	322	656	636	308	656	626	380	379	321	408	379	353
Back of Queue (Q), veh/ln (50th percentile)	1.7	13.6	13.3	1.8	12.1	11.7	1.8	3.7	2.0	3.5	4.3	4.2
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	18.1	27.3	27.3	18.9	26.7	26.7	23.0	31.6	30.5	28.8	32.0	32.1
Incremental Delay (d_2), s/veh	3.4	15.2	15.6	4.2	11.5	12.0	1.8	4.1	2.5	15.2	5.2	5.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.5	42.5	42.9	23.1	38.1	38.6	24.8	35.7	33.0	44.0	37.2	38.0
Level of Service (LOS)	C	D	D	C	D	D	C	D	C	D	D	D
Approach Delay, s/veh / LOS	40.6	D		36.7	D		32.0	C		40.5	D	
Intersection Delay, s/veh / LOS	38.3						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.5	A	0.8	A	1.1	A

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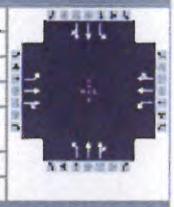
HCS Intersection Capacity Analysis
Design Year 2033 - 'Build' - PM Peak
South Green & Cedar Road

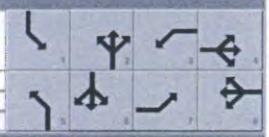
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	DTP	Analysis Date	9/14/2012	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green and Cedar Rc	Analysis Year	Design Year 2033 'Build'	Analysis Period	1> 7:00
File Name	South Green and Cedar PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	143	904	80	157	822	140	119	266	87	303	301	129

Signal Information					EB		WB			
Cycle, s	90.0	Reference Phase	2							
Offset, s	0	Reference Point	End	Green	10.0	19.7	10.0	30.3	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.0	3.0	3.0	3.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	35.3	15.0	35.3	15.0	24.7	15.0	24.7
Change Period, (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Queue Clearance Time (g_s), s	6.9	27.3	7.4	26.9	6.9	10.8	12.0	13.2
Green Extension Time (g_e), s	0.1	1.7	0.1	1.9	0.1	1.3	0.0	1.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	1.00	0.96	0.97	0.10	1.00	0.26

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	159	555	539	174	548	521	132	202	191	337	248	229
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1863	1809	1774	1863	1768	1774	1863	1707	1774	1863	1674
Queue Service Time (g_s), s	4.9	25.3	25.3	5.4	24.9	24.9	4.9	8.5	8.8	10.0	10.8	11.2
Cycle Queue Clearance Time (g_c), s	4.9	25.3	25.3	5.4	24.9	24.9	4.9	8.5	8.8	10.0	10.8	11.2
Capacity (c), veh/h	309	627	609	306	627	595	364	408	374	396	408	367
Volume-to-Capacity Ratio (X)	0.515	0.884	0.885	0.571	0.874	0.875	0.363	0.495	0.510	0.849	0.609	0.626
Available Capacity (c_a), veh/h	309	627	609	306	627	595	364	408	374	396	408	367
Back of Queue (Q), veh/ln (50th percentile)	2.4	13.5	13.2	2.7	13.2	12.6	2.2	4.2	4.0	4.4	5.5	5.2
Overflow Queue (Q_3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Storage Ratio (RQ) (50th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	19.6	28.2	28.2	19.9	28.1	28.1	22.6	30.8	30.9	28.6	31.7	31.8
Incremental Delay (d_2), s/veh	6.0	16.6	17.1	7.5	15.6	16.4	2.8	4.2	4.9	19.8	6.6	7.8
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	25.7	44.8	45.3	27.5	43.7	44.4	25.4	35.0	35.8	48.4	38.3	39.7
Level of Service (LOS)	C	D	D	C	D	D	C	D	D	D	D	D
Approach Delay, s/veh / LOS	42.6	D		41.7	D		32.9	C		42.9	D	
Intersection Delay, s/veh / LOS	41.0						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.8	C	2.8	C
Bicycle LOS Score / LOS	1.5	A	1.5	A	0.9	A	1.2	A

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APPENDIX H
MODIFIED TRAFFIC SIGNAL WARRANT ANALYSIS

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : **01/16/13**
Page No. : **1**

Signal Warrants - Summary

Major Street Approaches

Northbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **6,584**

Southbound: **South Green Road**
Number of Lanes: **2**
Approach Speed: **35**
Total Approach Volume: **6,069**

Minor Street Approaches

Eastbound:
Number of Lanes: **1**

Total Approach Volume: **8**

Westbound: **Notre Dame College Drive**
Number of Lanes: **1**

Total Approach Volume: **945**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... Satisfied

Warrant 1A - Minimum Vehicular Volume ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... Satisfied
Required volumes reached for 9 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... Not Satisfied
Number of hours (2) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour ..... Not Satisfied

Warrant 3A - Peak Hour Delay ..... Not Satisfied
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... Not Satisfied
Volumes do not exceed minimums for any hour.

Warrant 4 - Pedestrian Volumes ..... Not Evaluated

Warrant 5 - School Crossing ..... Not Evaluated

Warrant 6 - Coordinated Signal System ..... Not Evaluated

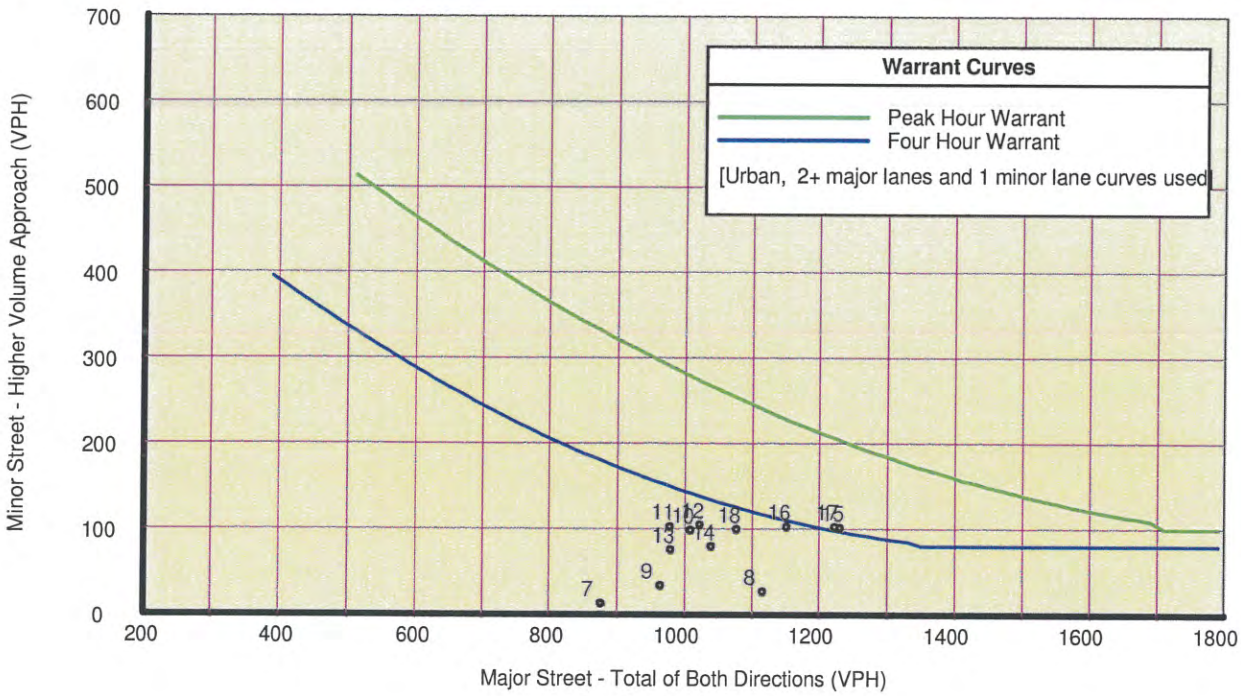
Warrant 7 - Crash Experience ..... Not Evaluated

Warrant 8 - Roadway Network ..... Not Evaluated

GPD Group
520 South Main Street, Suite 2531 Akron, OH 44311
(330) 572-2100

Study Name :
Study Date : 01/16/13

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
01:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
02:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
03:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
04:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
05:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
06:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
07:00	876	13	WB	600-Yes	150-No	Major	900-No	75-No	---	720-Yes	120-No	Major
08:00	1,115	27	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
09:00	963	34	WB	600-Yes	150-No	Major	900-Yes	75-No	Major	720-Yes	120-No	Major
10:00	1,007	99	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
11:00	977	103	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
12:00	1,021	105	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
13:00	978	76	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
14:00	1,038	80	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
15:00	1,230	102	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
16:00	1,150	103	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
17:00	1,222	103	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
18:00	1,076	100	WB	600-Yes	150-No	Major	900-Yes	75-Yes	Both	720-Yes	120-No	Major
19:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
20:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
21:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
22:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---
23:00	0	0	EB	600-No	150-No	---	900-No	75-No	---	720-No	120-No	---

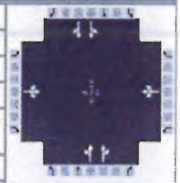
APPENDIX I
MODIFIED HCS INTERSECTION CAPACITY ANALYSIS

OPENING YEAR 2013 'BUILD MODIFIED' CONDITIONS

HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build Modified' - AM Peak
South Green & Library Drive / Notre Dame College Drive

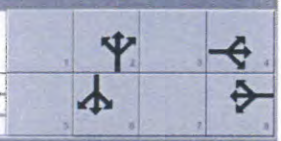
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	SGM	Analysis Date	Jan 15, 2013	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Dri	Analysis Year	Opening Year 2013 'Build'	Analysis Period	1> 7:00
File Name	South Green and NDC(modified) AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	7	0	3	13	0	7	7	453	131	110	446	17

Signal Information									
Cycle, s	60.0	Reference Phase	2						
Offset, s	0	Reference Point	End						
Uncoordinated	Yes	Simult. Gap E/W	On	Green	30.4	19.6	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0
				Red	2.0	2.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		24.6		24.6		35.4		35.4
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.3		3.3
Queue Clearance Time (g_s), s		2.3		2.5		9.1		19.9
Green Extension Time (g_e), s		0.0		0.0		3.1		2.6
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.02		0.20

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		11			22		354		303	147		489
Adjusted Saturation Flow Rate (s), veh/h/ln		951			991		1837		1560	467		1683
Queue Service Time (g_s), s		0.0			0.0		0.0		7.1	10.8		12.1
Cycle Queue Clearance Time (g_c), s		0.3			0.5		6.9		7.1	17.9		12.1
Capacity (c), veh/h		413			423		992		790	347		853
Volume-to-Capacity Ratio (X)		0.027			0.053		0.357		0.383	0.425		0.574
Available Capacity (c_a), veh/h		413			423		992		790	347		853
Back of Queue (Q), veh/ln (50th percentile)		0.1			0.2		2.5		2.2	1.7		4.2
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		13.7			13.8		9.0		9.1	13.5		10.3
Incremental Delay (d_2), s/veh		0.1			0.2		1.0		1.4	3.8		2.8
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		13.8			14.0		10.0		10.5	17.3		13.1
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	13.8	B		14.0	B		10.2	B		14.1	B	
Intersection Delay, s/veh / LOS	12.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.5	A	1.0	A	1.0	A

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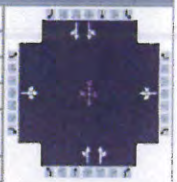
HCS Intersection Capacity Analysis
Opening Year 2013 - 'Build Modified' - PM Peak
South Green & Library Drive / Notre Dame College Drive

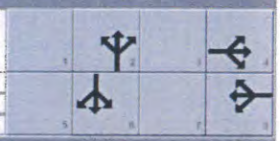
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	SGM	Analysis Date	Jan 15, 2013	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0.90
Intersection	South Green Road and Dri	Analysis Year	Opening Year 2013 'Build'	Analysis Period	1> 7:00
File Name	South Green and NDC(modified) PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	74	0	32	75	0	41	29	600	84	54	540	69

Signal Information										
Cycle, s	60.0	Reference Phase	2							
Offset, s	0	Reference Point	End							
Uncoordinated	Yes	Simult. Gap E/W	On	Green	27.5	22.5	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	0.0	0.0	0.0	0.0
				Red	2.0	2.0	0.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		27.5		27.5		32.5		32.5
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.4		3.4		3.2		3.2
Queue Clearance Time (g_s), s		4.7		5.1		12.2		12.9
Green Extension Time (g_e), s		0.5		0.5		3.4		3.3
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.10		0.11

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		118			129		404		388	331		405
Adjusted Saturation Flow Rate (s), veh/h/ln		990			1008		1686		1625	1327		1639
Queue Service Time (g_s), s		0.0			0.4		0.0		10.2	0.7		10.7
Cycle Queue Clearance Time (g_c), s		2.7			3.1		9.0		10.2	10.9		10.7
Capacity (c), veh/h		473			477		838		745	679		751
Volume-to-Capacity Ratio (X)		0.249			0.270		0.482		0.522	0.488		0.539
Available Capacity (c_a), veh/h		473			477		838		745	679		751
Back of Queue (Q), veh/ln (50th percentile)		1.1			1.2		3.5		3.5	2.9		3.8
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		12.6			12.6		11.2		11.6	10.7		11.7
Incremental Delay (d_2), s/veh		1.3			1.4		2.0		2.6	2.5		2.8
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		13.8			14.0		13.2		14.2	13.2		14.5
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	13.8	B		14.0	B		13.7	B		13.9	B	
Intersection Delay, s/veh / LOS	13.8						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.7	A	0.7	A	1.1	A	1.1	A

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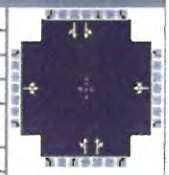
DESIGN YEAR 2033 'BUILD MODIFIED' CONDITIONS

HCS Intersection Capacity Analysis
Design Year 2033 - 'Build Modified' - AM Peak
South Green & Library Drive / Notre Dame College Drive

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	SGM	Analysis Date	Jan 15, 2013	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	AM Peak Hour	PHF	0.90
Intersection	South Green Road and Dri	Analysis Year	Design Year 2033 'Build'	Analysis Period	1> 7:00
File Name	South Green and NDC(modified) AM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	7	0	3	14	0	8	7	498	144	120	491	17

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Green	31.5	18.5	0.0	0.0	0.0	0.0		
Yellow	3.0	3.0	0.0	0.0	0.0	0.0		
Red	2.0	2.0	0.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		23.5		23.5		36.5		36.5
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.2		3.2		3.3		3.3
Queue Clearance Time (g_s), s		2.3		2.6		9.7		23.5
Green Extension Time (g_e), s		0.0		0.0		3.6		2.6
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.03		0.40

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		11			24		389		332	133		564
Adjusted Saturation Flow Rate (s), veh/h/ln		952			1004		1838		1560	365		1685
Queue Service Time (g_s), s		0.0			0.0		0.0		7.7	13.8		14.4
Cycle Queue Clearance Time (g_c), s		0.3			0.6		7.5		7.7	21.5		14.4
Capacity (c), veh/h		395			408		1026		819	312		885
Volume-to-Capacity Ratio (X)		0.028			0.060		0.379		0.405	0.428		0.638
Available Capacity (c_a), veh/h		395			408		1026		819	312		885
Back of Queue (Q), veh/ln (50th percentile)		0.1			0.2		2.7		2.4	1.6		4.9
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0.0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		14.4			14.6		8.6		8.6	15.1		10.2
Incremental Delay (d_2), s/veh		0.1			0.3		1.1		1.5	4.2		3.5
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		14.6			14.8		9.6		10.1	19.3		13.7
Level of Service (LOS)		B			B		A		B	B		B
Approach Delay, s/veh / LOS	14.6	B		14.8	B		9.8	A		14.8	B	
Intersection Delay, s/veh / LOS	12.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.5	A	0.5	A	1.1	A	1.1	A

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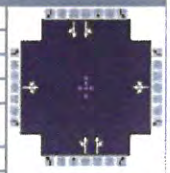
HCS Intersection Capacity Analysis
Design Year 2033 - 'Build Modified' - PM Peak
South Green & Library Drive / Notre Dame College Drive

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	GPD Group			Duration, h	0.25
Analyst	SGM	Analysis Date	Jan 15, 2013	Area Type	Other
Jurisdiction	South Euclid, OH	Time Period	PM Peak Hour	PHF	0 90
Intersection	South Green Road and Dri	Analysis Year	Design Year 2033 'Build'	Analysis Period	1> 7 00
File Name	South Green and NDC(modified) PM.xus				
Project Description	Proposed Cuyahoga County Public Library				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	74	0	32	83	0	45	29	660	93	60	593	69

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	28.1	21.9	0.0	0.0	0.0	0.0		
Yellow	3.0	3.0	0.0	0.0	0.0	0.0		
Red	2.0	2.0	0.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8		2		6
Case Number		8.0		8.0		8.0		8.0
Phase Duration, s		26.9		26.9		33.1		33.1
Change Period, (Y+Rc), s		5.0		5.0		5.0		5.0
Max Allow Headway (MAH), s		3.4		3.4		3.3		3.3
Queue Clearance Time (g_s), s		4.9		5.7		13.3		14.9
Green Extension Time (g_e), s		0.5		0.5		3.8		3.7
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.15		0.19

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		118			142		443		426	337		465
Adjusted Saturation Flow Rate (s), veh/h/ln		995			1019		1691		1624	1188		1646
Queue Service Time (g_s), s		0.0			0.8		0.0		11.3	1.5		12.6
Cycle Queue Clearance Time (g_c), s		2.9			3.7		10.0		11.3	12.9		12.6
Capacity (c), veh/h		465			471		856		761	628		771
Volume-to-Capacity Ratio (X)		0.253			0.302		0.518		0.559	0.537		0.603
Available Capacity (c_a), veh/h		465			471		856		761	628		771
Back of Queue (Q), veh/ln (50th percentile)		1.1			1.4		3.9		3.9	3.0		4.5
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0	0.0		0 0
Queue Storage Ratio (RQ) (50th percentile)		0.00			0.00		0.00		0.00	0.00		0.00
Uniform Delay (d_1), s/veh		13.0			13.2		11.1		11.5	10.5		11.8
Incremental Delay (d_2), s/veh		1.3			1.6		2.2		3.0	3.3		3.5
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0	0.0		0.0
Control Delay (d), s/veh		14.3			14.8		13.4		14.5	13.8		15.3
Level of Service (LOS)		B			B		B		B	B		B
Approach Delay, s/veh / LOS	14.3		B	14.8		B	13.9		B	14.7		B
Intersection Delay, s/veh / LOS	14.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.7	B	2.7	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	0.7	A	0.7	A	1.2	A	1.1	A

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