

## **Appendix F**

### **Traffic Conditions with Recommended Alternatives**



**COLUMBIA AVENUE 2025 TRAFFIC CONDITIONS WITH RECOMMENDED ALTERNATIVES**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**  
**Draft - April 26, 2006**

**Introduction**

Existing conditions in the S-48 Columbia Avenue corridor were documented in the S-48 Columbia Avenue Corridor Study Technical Memorandum No. 1 in August, 2005. An addendum to that study in November, 2005, reported these findings of the analysis of existing traffic and projected 2025 traffic with the existing geometry of Columbia Avenue:

- All of the study intersections can operate acceptably under existing traffic volumes as signalized intersections although some individual movements experience delay which is considered unacceptable.
- None of the study intersections can operate acceptably with existing geometry under 2025 traffic volumes as signalized intersections. Without major improvements in the corridor, delays will be high in 2025.

Since that report, several recommendations have been developed for the corridor. The primary recommendation is the widening of Columbia Avenue to three lanes from Chapin Road to just west of Ellett Road. From there to I-26, the road would be widened to five lanes. In addition, a southern connector has been recommended for construction as shown in Appendix A.

The South Carolina Department of Transportation (SCDOT) in cooperation with the Central Midlands Council of Governments (CMCOG) ran the regional transportation model which includes Chapin with these recommendations in place. The projected volumes in the vicinity of Columbia Avenue are shown in Appendix B.

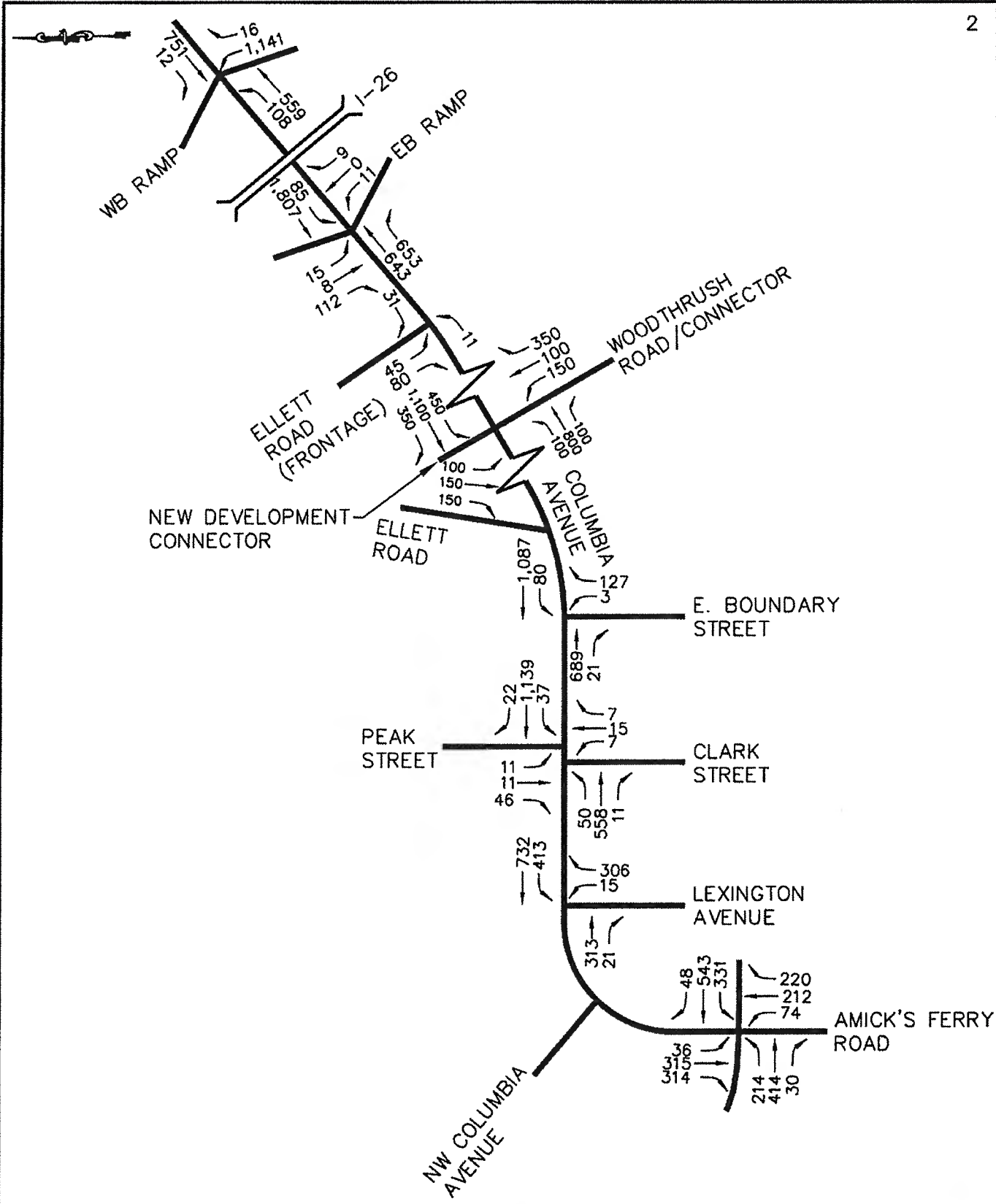
**Purpose of Report**

The purpose of this report is to examine the intersections along Columbia Avenue with the recommended alternatives and the associated projected volumes.

**2025 Design Volumes with Recommended Alternatives**

As explained in the Addendum to Technical Memorandum No.1, projecting future turning movement volumes in an existing corridor requires a growth rate at which the volumes can be increased for the number of years between the current year and the design year. Because the volumes upon which this study is based are from 2005, a direct ratio of 2025 to 2000 model volumes cannot be used. Linear growth rates that can be applied to 2005 design volumes are needed. Table 1 shows the development of those growth rates. The growth factors shown in Table 1 are the factors that a 2005 volume would be increased by to obtain 20 years of growth at the growth rate used.

It must be noted that, if the growth rate shown in Table 1 for Columbia Avenue between Ellett and Woodthrush were applied to the current 24-hour volume at that location, the future model volume for 2025 would not be obtained. Therefore, the calculated growth rates were increased to 1.5, 2.5, and 4.0 percent for the three sections of Columbia Avenue. The growth rates shown in Table 1 are reasonable growth rates for a 20-year period. All other growth rates used to project 2025 turning movement volumes with the recommended



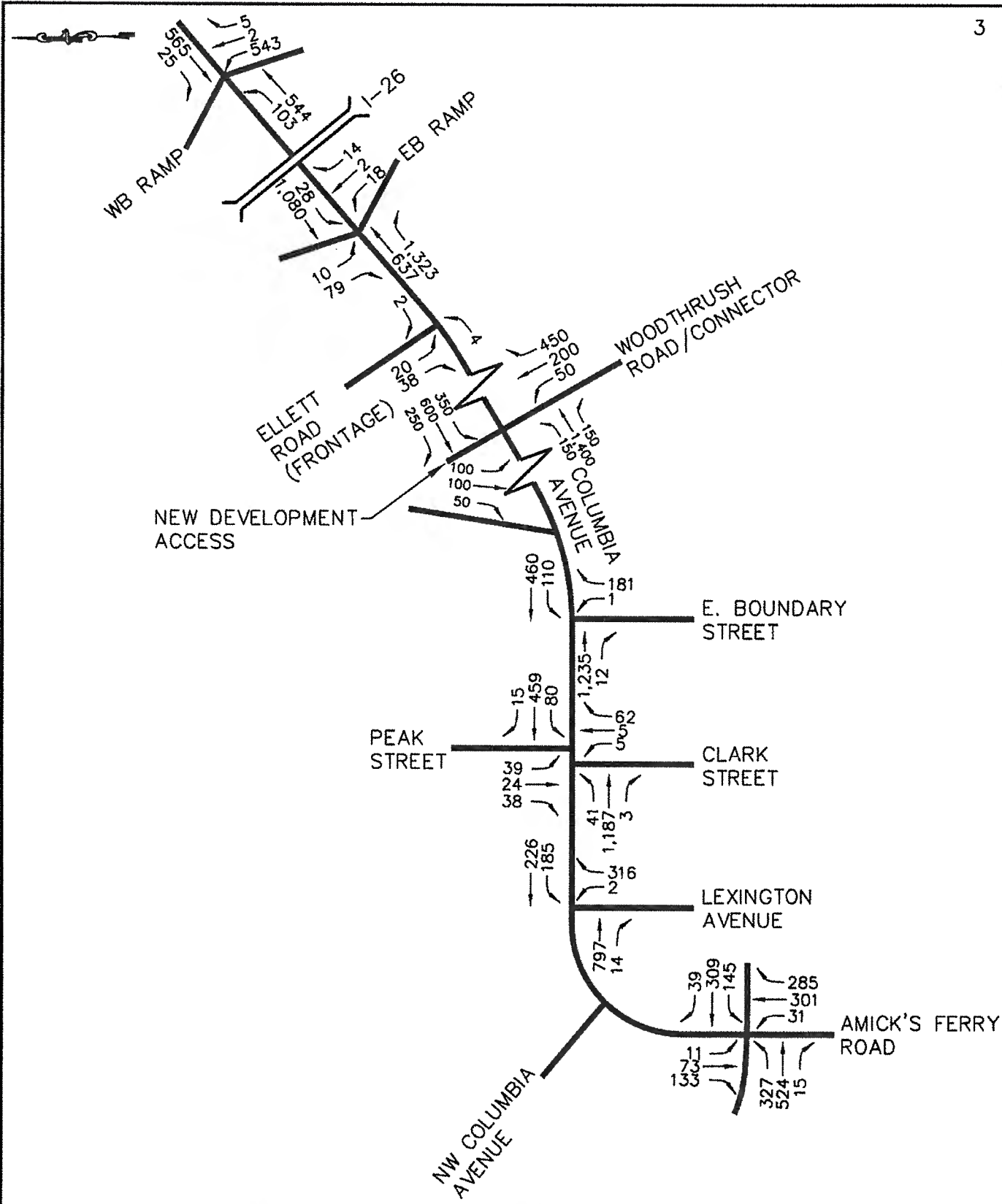
FIGURE

1

4/26/06

**2025 DESIGN VOLUMES-AFTERNOON PEAK HOUR  
 WITH SOUTHERN CONNECTOR  
 RECOMMENDED ALTERNATIVE ANALYSIS  
 S-48 COLUMBIA AVENUE CORRIDOR STUDY  
 CHAPIN, SOUTH CAROLINA**

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FIGURE

2

4/26/06

**2025 DESIGN VOLUMES-MORNING PEAK HOUR  
 WITH SOUTHERN CONNECTOR  
 RECOMMENDED ALTERNATIVE ANALYSIS  
 S-48 COLUMBIA AVENUE CORRIDOR STUDY  
 CHAPIN, SOUTH CAROLINA**

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alternative are the same as used to project 2025 turning movement volumes with existing geometry and can be found in the Addendum to Technical Memorandum No. 1.

**Table 1**  
**DEVELOPMENT OF LINEAR TRAFFIC GROWTH RATES**  
**BASED ON CMCOG TRANSPORTATION MODEL BASE (2000) AND PROJECTED (2025) VOLUMES**  
**WITH RECOMMENDED ALTERNATIVES (3-LANE/5-LANE AND SOUTHERN CONNECTOR)**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Road	Location	2000 Base	2025 Projected	Calculated Growth Rate	Growth Rate Used	Growth Factor
Amick's Ferry Corridor	S of Chapin Road	7,203	9,000	1%	1%	1.22
Chapin Road	East of Columbia Ave	7,450	9,000	1%	1%	1.22
Columbia Avenue	Amick's Ferry to Ellett Road	16,947	22,000	1%	1.5%	1.35
	Ellett Road to Woodthrush	16,646	29,000	2.2%	2.5%	1.64
	Woodthrush to I-26	16,336	35,000	3.1%	4%	2.19
New Connector	South of Columbia Ave	N/A	14,500	N/A	N/A	N/A
Lexington Avenue	South of Columbia Ave	5,600 (1)	1,000	Decrease	Decrease	Decrease

Notes:

- (1) Existing (2005) peak hour times 10

The growth factors shown in Table 1 were applied to the existing design volumes from the Technical Memorandum No. 1 Addendum to obtain the 2025 design volumes with the recommended alternatives shown in Figure 1 for the morning peak hour and in Figure 2 for the afternoon peak hour.

#### **Analysis of 2025 Design Volumes with Recommended Alternatives**

All of the input used in the analysis of future volumes with the existing geometry was also used in the analysis of future volumes with the recommended alternatives. The results of the analysis with the recommended alternatives are shown in Tables 2 through 8, and the corresponding printouts are included in Appendix C. Also *Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives*

*Draft – April 26, 2006*

shown in Tables 2 through 8 are the results of the analysis with 2025 volumes and existing geometry for comparison. For each intersection, analyses were conducted first with the base geometry conceptually proposed. Additional lanes were then added until an acceptable Level of Service (LOS) was obtained.

**Table 2**  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/AMICK'S FERRY ROAD/CHAPIN ROAD**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour			Afternoon Peak Hour		
	2025 No-Build Design Volumes	2025 With Recommended Alternatives		2025 No-Build Design Volumes	2025 With Recommended Alternatives	
		Base	W/ NB RTL		Base	W/ NB & SB RTL
LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay	
EB - Left	F/390	F/131	E/68	F/116	F/89	E/64
Through/right	F/178	F/86	E/58	F/194	D/36	D/35
WB - Left	F/187	E/55	C/28	F/382	F/124	F/97
Through/right	E/67	D/42	C/33	F/396	F/91	F/89
NB - Left	C/25	C/21	C/23	F/340	F/189	C/24
Through(right)	F/454	F/111	C/31	F/181	D/43	C/24
Right			B/18			B/14
SB - Left	C/30	C/23	C/23	D/53	C/22	C/21
Through(right)	C/33	C/24	C/27	F/373	F/138	C/27
Right						B/15
Overall	F/271	F/83	D/40	F/293	F/91	D/50

Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.
- EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, RTL = Right Turn Lane

*Columbia Avenue/Chapin Road* – The base geometry for this intersection is the existing geometry which includes a left turn lane and a through/right lane on each approach plus the addition of left turn phases on Chapin Road. Even with the volume reductions which can be gained from the southern connector, the intersection cannot operate acceptably in 2025 with the base geometry. The additions of northbound and southbound right turn lanes on Columbia Avenue and Amick's Ferry Road are needed.



**Table 3**  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/LEXINGTON AVENUE WITH BASE GEOMETRY**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour		Afternoon Peak Hour	
	2025 No-Build Design Volumes	2025 With Recommended Alternatives	2025 No-Build Design Volumes	2025 With Recommended Alternatives
	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay
EB - Through/right	F/127	B/16	A/5	A/8
WB – Left(through)	F/787	C/20	F/579	B/15
Through		A/7		B/13
NB - Left(right)	F/280	D/35	F/519	D/36
Right		F/105		E/71
Overall	F/356	C/34	F/460	C/23

Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.
- EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound

*Columbia Avenue/Lexington Avenue* – The base geometry for this intersection is one through lane in each direction on Columbia Avenue with a left turn lane westbound. The Lexington Avenue approach is proposed with separate left and right turn lanes. This base geometry can operate acceptably in the future with the recommended alternatives.

**Table 4**  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/CLARK STREET/PEAK STREET WITH BASE GEOMETRY**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour		Afternoon Peak Hour	
	2025 No-Build Design Volumes	2025 With Recommended Alternatives	2025 No-Build Design Volumes	2025 With Recommended Alternatives
	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay
EB - Left(through/right)	F/257	A/2	E/80	A/2
Through/right		B/11		A/3
WB - Left(through/right)	F/205	A/4	F/260	A/2
Through/right		A/2		B/12
NB - Left(through/right)	F/139	D/44	D/47	D/44
Through/right		E/65		D/45
SB - Left(through/right)	F/296	D/49	F/115	D/44
Through/right		D/52		D/53
Overall	F/238	B/12	F/192	B/11

## Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.
- EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound

*Columbia Avenue/Clark Street/Peak Street* – The base geometry for this intersection includes a left turn lane and a through/right lane on each approach. The intersection can operate acceptably with this geometry in 2025 with the recommended alternatives.



**Table 5**  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/EAST BOUNDARY STREET WITH BASE GEOMETRY**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour		Afternoon Peak Hour	
	2025 No-Build Design Volumes	2025 With Recommended Alternatives	2025 No-Build Design Volumes	2025 With Recommended Alternatives
	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay
EB - Through/right	F/277	E/59	B/16	A/8
WB – Left(through)	F/821	B/13	F/331	A/15
Through		A/6		C/20
NB - Left(right)	F/688	D/42	F/368	D/42
Right		F/89		D/52
Overall	F/491	D/46	F/220	B/18

Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.
- EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound

*Columbia Avenue/East Boundary Street* – The base geometry for this intersection is one through lane in each direction on Columbia Avenue with a left turn lane westbound. The East Boundary Street approach is proposed with separate left and right turn lanes. This base geometry can operate acceptably in the future with recommended alternatives.

Table 6  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/I-26 EASTBOUND RAMP**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour		Afternoon Peak Hour		
	2025 No-Build Design Volumes	2025 With Recommended Alternatives	2025 No-Build Design Volumes	2025 With Recommended Alternatives	
		Base		Base	5-Lane
	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay
EB - Through(right)	F/217	A/5	D/41	A/2	A/3
Right		D/42		A/2	A/5
WB - Left(through)	D/55	D/51	F/309	F/209	A/3
Through					A/7
NB - Left(through/right)	D/47	D/42	D/45	E/71	C/29
Through/right		D/42		E/68	C/28
SB - Left(through/right)	F/143	D/42	F/230	E/69	C/69
Through/right		D/47		F/374	E/61
Overall	F/149	D/38	F/200	F/134	A/8

## Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.
- EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound

*Columbia Avenue/I-26 Eastbound Ramp* – The base geometry for this intersection adds only a right turn lane eastbound and left turn lanes on the side streets to the existing geometry. This geometry was examined to determine if improvements to the interstate bridge could be avoided, but they can not. This geometry cannot operate acceptably in the afternoon peak hour in 2025 with the base geometry. Using a five-lane section for Columbia Avenue plus the addition of left turn lanes on the side street and the right turn lane eastbound allows the intersection to operate acceptably during the afternoon peak hour in 2025.

**Table 7**  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/I-26 WESTBOUND RAMPS**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour			Afternoon Peak Hour		
	2025 No-Build Design Volumes	2025 With Recommended Alternatives		2025 No-Build Design Volumes	2025 With Recommended Alternatives	
		Base	5-Lane		Base	5-Lane+
	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay	LOS/Delay
EB - Left(through)	F/153	F/86	C/21	F/370	F/358	C/25
Through			B/16			B/13
WB – Through(right)	B/18	B/16	B/17	E/58	D/53	B/15
Right		A/9			B/13	
NB - Left(through/right)	F/248			F/367		C/26
(Left)Through		F/288	E/71		F/361	C/26
Right		C/27	B/13		B/18	B/10
Overall	F/132	F/118	C/32	F/269	F/262	B/19

## Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.
- EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound

*Columbia Avenue/I-26 Westbound Ramps* – The base geometry for this intersection adds only a right turn lane westbound and a right turn lane northbound on the ramp. This geometry was examined to determine if improvements to the interstate bridge could be avoided, but they cannot. This geometry can not operate acceptably in 2025 with the base geometry. Using a five-lane section for Columbia Avenue plus the addition of a left/through lane on the ramp allows the intersection to operate acceptably in the morning peak hour in 2025. In the afternoon peak hour, however, dual lefts are required on the side street to allow acceptable operation.



**Table 8**  
**CAPACITY ANALYSIS RESULTS - SIGNALIZED INTERSECTION**  
**2025 DESIGN VOLUMES – NO-BUILD AND WITH RECOMMENDED ALTERNATIVES**  
**COLUMBIA AVENUE/SOUTHERN CONNECTOR WITH BASE GEOMETRY**  
**Columbia Avenue 2025 Traffic Conditions with Recommended Alternatives**  
**S-48 Columbia Avenue Corridor Study**  
**Chapin, South Carolina**

Movement	Morning Peak Hour		Afternoon Peak Hour	
	2025 With Recommended Alternatives		2025 With Recommended Alternatives	
	LOS/Delay		LOS/Delay	
Eastbound - Left	C/29	D/35		
Through/right	F/85	B/18		
Westbound - Left	F/99	D/44		
Through/right	A/5	A/8		
Northbound - Left	C/34	F/204		
Through	D/44	C/34		
Right	C/30	C/23		
Southbound - Left	F/104	D/37		
Through/right	C/33	D/37		
Overall	D/55	C/28		

## Notes:

- LOS – Level of Service
- Delay is in seconds per vehicle.

*Columbia Avenue/Southern Connector* – A new street was also assumed on the northern leg of this intersection by 2025 to serve new development north of Columbia Avenue. With that new leg, the base geometry for this intersection is a five-lane section on Columbia Avenue; a left turn lane, a through lane, and a through/right lane southbound; and a left turn lane, a through lane, and a right turn lane northbound. The overall intersection can operate acceptably in 2025 with this base geometry. However, the westbound left is expected to be about 450 vehicles per hour. When a left turn volume is over 300 per hour, a dual left should be considered. Because the intersection can operate acceptably without it, the dual left can either be constructed with the widening to five lanes and striped out until it is needed or the right-of-way can be reserved for the addition of the second left turn lane in the future if it is needed.

## Conclusions

The intersection geometries needed for the study intersections on Columbia Avenue to operate acceptably in 2025 with the recommended alternatives are:

- *Columbia Avenue/Amick's Ferry/Chapin Road* – existing geometry (including the addition of left turn phases on Chapin Road) plus right turn lanes southbound on Columbia Avenue and northbound on Amick's Ferry
- *Columbia Avenue/Lexington Avenue* – three-lane section on Columbia Avenue and separate left turn and right turn lanes on Lexington approach
- *Columbia Avenue/Clark Street/Peak Street* – three-lane section on Columbia Avenue and left turn lane and through/right lane on each side street approach
- *Columbia Avenue/East Boundary Street* – three-lane section on Columbia Avenue and separate left turn and right lanes on Boundary approach
- *Columbia Avenue/I-26 Eastbound Ramp* – five-lane section on Columbia Avenue plus right turn lane eastbound with left turn lane and through/right lane on each side street approach
- *Columbia Avenue/I-26 Westbound Ramp* – five-lane section on Columbia Avenue plus right turn lane and dual lefts northbound on the ramp. Through movements can be served from the inside left turn lane on the ramp.
- *Columbia Avenue/South Connector* – five-lane section on Columbia; left turn lane, through lane, and through/right lane southbound, and left turn lane, through lane, and right turn lane northbound. Provisions for a future dual left westbound should be made by building the extra lane with the widening and striping if out until it is needed or by providing right-of-way for the future addition of the lane.



Sprague & Sprague Consulting Engineers

**Appendix A**  
**CONCEPTUAL SOUTHERN CONNECTOR ROUTE**



# S-48 Columbia Avenue Corridor Study

## LEGEND

-  Town of Chapin
-  Study Area

Source: GMECMA 2006; Town of Chapin 2005  
Map Created: 01/2006

This map is for conceptual planning purposes only, and is  
not intended for legal or financial purposes. However, no guarantee  
is made as to the accuracy or completeness of the information.

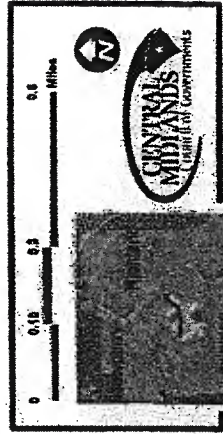


Figure 1.5-1  
Study Area





**S-48 CHAPIN CORRIDOR STUDY**

Location	No Build		With Connector	
	2-Way Volume	LOS	2-Way Volume	LOS
S-48 (I-26 to Woodthrush)	36,000	F	35,000	F
S-48 (Woodthrush to Ellett)	36,000	F	29,000	E
S-48 (Ellett to Peak)	40,000	F	22,000	F
S-48 (Peak to Amick's Ferry)	33,000	F	22,000	F
New Connector (S-48 to US 76)			12,000-17,000	A-B
US 76	11,000-13,000	D-E	9,000-11,000	C-D
Lexington Ave.	5,000	B	1,000	A
Amick's Ferry	17,000	F	9,000	D
St. Peter's Church	9,000	D	8,000	B



**Appendix C**  
**CAPACITY ANALYSIS PRINTOUTS**

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 4/21/2006  
 Period: WED AM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: CHAPIN ROAD

Inter.: CHAPIN/COLUMBIA/AMICK'S FERRY  
 Area Type: CBD or Similar  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: COLUMBIA AVE/AMICK'S FERRY RD

SIGNALIZED INTERSECTION SUMMARY

CC25RAWA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	1	0	1	1	0
LGConfig	L	TR		L	TR		L	TR		L	TR	
Volume	327	524	15	145	309	39	31	301	285	11	73	133
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
RTOR Vol			0			0			0			0

Duration	0.25	Area Type	CBD or Similar							
Signal Operations										
Phase Combination	1	2	3	4	5	6	7	8		
EB Left		A			NB Left	A				
Thru			A		Thru	A				
Right				A	Right	A				
Peds					Peds					
WB Left		A			SB Left	A				
Thru			A		Thru	A				
Right				A	Right	A				
Peds					Peds					
NB Right					EB Right					
SB Right					WB Right					
Green		11.3	45.7			58.0				
Yellow		3.5	3.5			3.5				
All Red		1.5	1.5			1.5				

Cycle Length: 130.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	306	1540	1.12	0.48	131.1	F		
TR	556	1582	1.02	0.35	85.9	F	103.0	F
<b>Westbound</b>								
L	199	1525	0.85	0.48	55.3	E		
TR	556	1583	0.73	0.35	41.5	D	45.5	D
<b>Northbound</b>								
L	394	882	0.10	0.45	21.0	C		
TR	651	1459	1.12	0.45	110.7	F	106.2	F
<b>Southbound</b>								
L	66	148	0.18	0.45	23.0	C		
TR	646	1448	0.36	0.45	24.1	C	24.0	C

Intersection Delay = 83.1 (sec/veh)      Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 4/21/2006  
 Period: WED AM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE + NB RT  
 E/W St: CHAPIN ROAD

Inter.: CHAPIN/COLUMBIA/AMICK'S FERRY  
 Area Type: CBD or Similar  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: COLUMBIA AVE/AMICK'S FERRY RD

SIGNALIZED INTERSECTION SUMMARY

CC25RHPA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	1	1	1	1	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	327	524	15	145	309	39	31	301	285	11	73	133
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0	12.0	11.0	11.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: CBD or Similar

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
WB Left		A			SB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
NB Right		A			EB Right			
SB Right					WB Right			
Green		12.0	46.0			47.0		
Yellow		3.5	3.5			3.5		
All Red		1.5	1.5			1.5		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	364	1540	0.95	0.53	67.6	E		
TR	606	1582	0.94	0.38	58.0	E	61.6	E
<b>Westbound</b>								
L	255	1525	0.66	0.53	27.9	C		
TR	607	1583	0.67	0.38	33.4	C	31.8	C
<b>Northbound</b>								
L	336	857	0.12	0.39	23.4	C		
T	605	1545	0.62	0.39	31.3	C	24.7	C
R	753	1411	0.47	0.53	17.9	B		
<b>Southbound</b>								
L	238	607	0.05	0.39	22.7	C		
TR	567	1448	0.41	0.39	26.9	C	26.7	C

Intersection Delay = 40.0 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 10/17/2005  
 Period: T/T PM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: CHAPIN ROAD

Inter.: CHAPIN/COLUMBIA/AMICK'S FERRY  
 Area Type: CBD or Similar  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: COLUMBIA AVE/AMICK'S FERRY RD

SIGNALIZED INTERSECTION SUMMARY

CC25RATP

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	1	0	1	1	0
LGConfig	L	TR		L	TR		L	TR		L	TR	
Volume	214	414	30	331	543	48	74	212	220	36	315	314
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: CBD or Similar

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
WB Left	A				SB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	9.7	36.8			38.5			
Yellow	3.5	3.5			3.5			
All Red	1.5	1.5			1.5			

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	223	1555	1.00	0.51	88.7	F		
TR	583	1585	0.79	0.37	35.6	D	52.9	D
<b>Westbound</b>								
L	310	1540	1.14	0.51	124.0	F		
TR	584	1588	1.08	0.37	91.3	F	103.0	F
<b>Northbound</b>								
L	72	170	1.17	0.38	188.8	F		
TR	563	1462	0.87	0.38	42.5	D	63.9	E
<b>Southbound</b>								
L	157	408	0.25	0.38	21.7	C		
TR	563	1463	1.20	0.38	138.0	F	131.7	F

Intersection Delay = 90.7 (sec/veh) Intersection LOS = F



HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: CHAPIN/COLUMBIA/AMICK'S FERRY  
 Agency: SPRAGUE & SPRAGUE Area Type: CBD or Similar  
 Date: 10/17/2005 Jurisd: CHAPIN  
 Period: T/T PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE + NB & SB RT  
 E/W St: CHAPIN ROAD N/S St: COLUMBIA AVE/AMICK'S FERRY RD

SIGNALIZED INTERSECTION SUMMARY

CC25TRNSP

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	1	1	1	1	1
LGConfig	L	TR		L	TR		L	T	R	L	T	R
Volume	214	414	30	331	543	48	74	212	220	36	315	314
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0	12.0	11.0	11.0	12.0
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: CBD or Similar

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A	A		NB Left	A		
Thru			A		Thru	A		
Right			A		Right	A		
Peds					Peds			
WB Left		A	A		SB Left	A		
Thru			A		Thru	A		
Right			A		Right	A		
Peds					Peds			
NB Right		A			EB Right			
SB Right		A			WB Right			
Green		11.0	37.0			37.0		
Yellow		3.5	3.5			3.5		
All Red		1.5	1.5			1.5		

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	243	1555	0.92	0.53	63.9	E		
TR	586	1585	0.79	0.37	35.2	D	44.5	D
<b>Westbound</b>								
L	332	1540	1.06	0.53	96.6	F		
TR	588	1588	1.07	0.37	88.7	F	91.5	F
<b>Northbound</b>								
L	249	674	0.34	0.37	23.5	C		
T	572	1545	0.42	0.37	24.0	C	19.4	B
R	755	1425	0.33	0.53	13.7	B		
<b>Southbound</b>								
L	312	844	0.13	0.37	21.0	C		
T	572	1545	0.59	0.37	27.1	C	21.0	C
R	755	1425	0.45	0.53	14.9	B		
Intersection Delay = 49.5 (sec/veh)					Intersection LOS = D			

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/LEXINGTON  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/06 Jurisd: CHAPIN  
 Period: T/T AM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: COLUMBIA AVE/LEXINGTON AVE

SIGNALIZED INTERSECTION SUMMARY

CL2JRAFTA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	1	1	0	0	0	0
LGConfig	TR			L T			L TR					
Volume	797 14			185 226			2 1 316					
Lane Width	11.0			11.0 11.0			11.0 11.0					
RTOR Vol	0						0					

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	82.0				28.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c g/C		Lane Group Delay LOS		Approach Delay LOS	
<b>Eastbound</b>								
TR	1171	1714	0.78	0.68	16.3	B	16.3	B
<b>Westbound</b>								
L	331	484	0.73	0.68	20.3	C		
T	1173	1717	0.25	0.68	7.4	A	13.2	B
<b>Northbound</b>								
L	377	1616	0.01	0.23	35.3	D		
TR	361	1546	1.04	0.23	105.4	F	105.0	F
<b>Southbound</b>								

Intersection Delay = 33.7 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/LEXINGTON  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: T/T PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: COLUMBIA AVE/LEXINGTON AVE

SIGNALIZED INTERSECTION SUMMARY

CL25RATP

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	1	0	0	0
LGConfig	TR			L	T		LT R					
Volume	313 21			413 731			15 1 306					
Lane Width	11.0			11.0 11.0			11.0 12.0					
RTOR Vol	0						0					

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	82.0				28.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
TR	1168	1709	0.31	0.68	7.8	A	7.8	A
<b>Westbound</b>								
L	633	927	0.69	0.68	14.5	B		
T	1173	1717	0.67	0.68	12.6	B	13.3	B
<b>Northbound</b>								
LT	381	1631	0.05	0.23	35.7	D	69.0	E
R	373	1599	0.91	0.23	70.7	E		
<b>Southbound</b>								

Intersection Delay = 22.5 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 10/17/2005  
 Period: WED AM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE

Inter.: COLUMBIA/CLARK/PEAK  
 Area Type: All other areas  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: CLARK STREET/PEAK STREET

SIGNALIZED INTERSECTION SUMMARY

CP 25 TRAWA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	1	0	1	1	0
LGConfig	L	TR		L	TR		L	TR		L	TR	
Volume	41	1187	3	80	459	15	5	5	62	39	24	38
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
WB Left		A			SB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	83.0				7.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	650	783	0.07	0.83	1.6	A		
TR	1424	1716	0.87	0.83	11.3	B	11.0	B
<b>Westbound</b>								
L	218	263	0.45	0.83	3.8	A		
TR	1418	1709	0.41	0.83	2.4	A	2.6	A
<b>Northbound</b>								
L	91	1298	0.07	0.07	43.8	D		
TR	107	1535	0.71	0.07	65.2	E	63.6	E
<b>Southbound</b>								
L	88	1262	0.47	0.07	48.6	D		
TR	116	1650	0.57	0.07	51.5	D	50.4	D

Intersection Delay = 12.3 (sec/veh) Intersection LOS = B



HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/CLARK/PEAK  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: T/T PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: CLARK STREET/PEAK STREET

SIGNALIZED INTERSECTION SUMMARY

CP25RAIP

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	1	1	0	1	1	0
LGConfig	L	TR		L	TR		L	TR		L	TR	
Volume	50	558	11	37	1139	22	7	15	7	11	11	46
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
RTOR Vol			0			0			0			0

Duration	0.25	Area Type:	All other areas					
Signal Operations								
Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	83.0				7.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	214	258	0.26	0.83	2.5	A		
TR	1422	1713	0.44	0.83	2.5	A	2.5	A
<b>Westbound</b>								
L	592	713	0.07	0.83	1.6	A		
TR	1421	1712	0.88	0.83	12.0	B	11.7	B
<b>Northbound</b>								
L	90	1287	0.10	0.07	44.0	D		
TR	120	1714	0.23	0.07	45.0	D	44.7	D
<b>Southbound</b>								
L	95	1357	0.14	0.07	44.3	D		
TR	111	1591	0.59	0.07	52.9	D	51.4	D

Intersection Delay = 10.7 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 4/20/2006  
 Period: T/T AM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE

Inter.: COLUMBIA/E BOUNDARY  
 Area Type: All other areas  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: E BOUNDARY STREET

SIGNALIZED INTERSECTION SUMMARY

CB25RATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	1	0	0	0
LGConfig	TR			L	T		LT R					
Volume	1235 12			110	460		1	1	181			
Lane Width	11.0			11.0	11.0		11.0 12.0					
RTOR Vol	0						0					

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	90.0				20.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
Eastbound								
TR	1287	1716	1.06	0.75	59.2	E	59.2	E
Westbound								
L	236	314	0.63	0.75	12.5	B		
T	1288	1717	0.48	0.75	6.2	A	7.4	A
Northbound								
LT	299	1792	0.01	0.17	41.7	D	88.2	F
R	267	1599	0.94	0.17	88.5	F		
Southbound								

Intersection Delay = 45.6 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/E BOUNDARY  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: T/T PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: E BOUNDARY STREET

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	1	1	0	0	0
LGConfig	TR			L	T		LT R					
Volume	689	21		80	1087		3	1	127			
Lane Width	11.0			11.0	11.0			11.0	12.0			
RTOR Vol			0						0			

Duration 0.25 Area Type: All other areas  
 Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left	A				SB Left			
Thru	A				Thru			
Right					Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	90.0				20.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
TR	1286	1714	0.61	0.75	7.8	A	7.8	A
<b>Westbound</b>								
L	448	597	0.19	0.75	4.6	A		
T	1288	1717	0.90	0.75	20.1	C	19.1	B
<b>Northbound</b>								
LT	294	1766	0.02	0.17	41.8	D	51.5	D
R	264	1583	0.64	0.17	51.8	D		
<b>Southbound</b>								

Intersection Delay = 17.6 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 10/17/2005  
 Period: T/T AM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE

Inter.: COLUMBIA/I-26 EB RAMP  
 Area Type: All other areas  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: I-26 EB RAMP

C6E25RBTBTA

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	1	0	1	1	0
LGConfig		T	R		LT		L	TR		L	TR	
Volume		637	1323	28	1080		18	2	14	10	1	79
Lane Width		11.0	12.0		11.0		11.0	11.0		11.0	11.0	
RTOR Vol			180						0			0

Duration 0.25 Area Type: All other areas  
 Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left		A			SB Left	A		
Thru		A			Thru	A		
Right					Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	85.0				15.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 110.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c g/c		Lane Group Delay LOS		Approach Delay LOS	
<b>Eastbound</b>								
T	1327	1717	0.52	0.77	5.1	A	28.7	C
R	1212	1568	1.01	0.77	41.9	D		
<b>Westbound</b>								
LT	1291	1671	1.05	0.77	50.6	D	50.6	D
<b>Northbound</b>								
L	154	1128	0.15	0.14	42.3	D		
TR	206	1512	0.10	0.14	41.8	D	42.1	D
<b>Southbound</b>								
L	171	1257	0.08	0.14	41.6	D		
TR	195	1433	0.54	0.14	47.2	D	46.6	D

Intersection Delay = 38.1 (sec/veh) Intersection LOS = D



HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 4/20/2006  
 Period: WED PM PEAK  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE

Inter.: COLUMBIA/I-26 EB RAMP  
 Area Type: All other areas  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: I-26 EB RAMP

SIGNALIZED INTERSECTION SUMMARY

*C6E25RBWP*

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	1	0	1	1	0
LGConfig		T	R		LT		L		TR	L		TR
Volume		643	653	85	1807		11	1	9	15	8	112
Lane Width		11.0	12.0		11.0		11.0	11.0		11.0	11.0	
RTOR Vol			0						0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left		A			SB Left	A		
Thru		A			Thru	A		
Right					Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	131.2				8.8			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 150.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
T	1502	1717	0.46	0.87	2.2	A	2.3	A
R	1385	1583	0.50	0.87	2.4	A		
<b>Westbound</b>								
LT	1403	1604	1.43	0.87	208.9	F	208.9	F
<b>Northbound</b>								
L	48	798	0.31	0.06	71.4	E		
TR	91	1556	0.14	0.06	67.7	E	69.7	E
<b>Southbound</b>								
L	77	1316	0.22	0.06	68.8	E		
TR	88	1507	1.57	0.06	373.9	F	340.4	F

Intersection Delay = 133.8 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/I-26 EB RAMP  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: WED PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - 5-LANE BRIDGE  
 E/W St: COLUMBIA AVENUE N/S St: I-26 EB RAMP

C6E255LWP

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	1	2	0	1	1	0	1	1	0
LGConfig		T	R	L	LT		L	TR		L	TR	
Volume		643	653	85	1807		11	1	9	15	8	112
Lane Width		11.0	12.0	11.0	11.0		11.0	11.0		11.0	11.0	
RTOR Vol			0						0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	A		
Thru	A				Thru	A		
Right	A				Right	A		
Peds					Peds			
WB Left		A			SB Left	A		
Thru		A			Thru	A		
Right					Right	A		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	52.4				7.6			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 70.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
T	2441	3261	0.28	0.75	2.9	A	3.8	A
R	1185	1583	0.59	0.75	4.7	A		
<b>Westbound</b>								
L	499	666	0.18	0.75	2.7	A		
LT	2441	3261	0.79	0.75	7.2	A	7.0	A
<b>Northbound</b>								
L	125	1147	0.12	0.11	28.6	C		
TR	169	1556	0.08	0.11	28.2	C	28.4	C
<b>Southbound</b>								
L	143	1316	0.12	0.11	28.5	C		
TR	164	1507	0.84	0.11	61.3	E	57.7	E

Intersection Delay = 8.1 (sec/veh) Intersection LOS = A

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/I-26 WB RAMP  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: T/T AM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: I-26 WB RAMP

*C6A/25R/TA*

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	1	0	1	1	0	0	0
LGConfig	LT			T R			LT R					
Volume	103	544		565	25		543	2	5			
Lane Width	11.0			11.0	12.0		11.0 12.0					
RTOR Vol				0			0					

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	A		
Thru	A				Thru	A		
Right					Right	A		
Peds					Peds			
WB Left					SB Left			
Thru	A				Thru			
Right	A				Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	67.3				32.7			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 110.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
LT	716	1171	1.10	0.61	86.4	F	86.4	F
<b>Westbound</b>								
T	1080	1766	0.68	0.61	15.9	B	15.6	B
R	969	1583	0.03	0.61	8.5	A		
<b>Northbound</b>								
LT	401	1350	1.53	0.30	287.8	F	285.3	F
R	471	1583	0.01	0.30	27.3	C		
<b>Southbound</b>								

Intersection Delay = 118.0 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/I-26 WB RAMP  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: T/T AM PEAK Year: 2025  
 Project ID: FUTURE VOLUMES - 5-LANE BRIDGE  
 E/W St: COLUMBIA AVENUE N/S St: I-26 WB RAMP

*SL*  
*C6W2J BETA*

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	0	2	0	0	1	1	0	0	0
LGConfig	L	T			TR			LT	R			
Volume	103	544			565	25	543	2	5			
Lane Width	11.0	11.0			11.0			11.0	12.0			
RTOR Vol						0			0			

Duration	0.25	Area Type	All other areas					
Signal Operations								
Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right					Right	A		
Peds					Peds			
WB Left					SB Left			
Thru		A			Thru			
Right		A			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		35.2				34.8		
Yellow		3.5				3.5		
All Red		1.5				1.5		
				Cycle Length: 80.0				secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c g/C		Lane Group Delay LOS		Approach Delay LOS	
<b>Eastbound</b>								
L	216	490	0.58	0.44	20.9	C		
T	1477	3357	0.45	0.44	15.8	B	16.7	B
<b>Westbound</b>								
TR	1468	3337	0.52	0.44	16.6	B	16.6	B
<b>Northbound</b>								
LT	587	1350	1.04	0.44	71.3	E	70.7	E
R	689	1583	0.01	0.44	12.8	B		
<b>Southbound</b>								

Intersection Delay = 32.0 (sec/veh) Intersection LOS = C



HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/I-26 WB RAMP  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: T/T PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: I-26 WB RAMP

SIGNALIZED INTERSECTION SUMMARY

*C6W257B4P*

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	1	0	1	1	0	0	0
LGConfig		LT			T	R		LT	R			
Volume	108	559			751	12	1141	1	6			
Lane Width		11.0			11.0	12.0		11.0	12.0			
RTOR Vol						0			0			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right					Right	A		
Peds					Peds			
WB Left					SB Left			
Thru		A			Thru			
Right		A			Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green		49.0				41.0		
Yellow		3.5				3.5		
All Red		1.5				1.5		

Cycle Length: 100.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
LT	409	835	1.72	0.49	358.1	F	358.1	F
<b>Westbound</b>								
T	882	1801	0.99	0.49	53.0	D	52.3	D
R	776	1583	0.02	0.49	13.1	B		
<b>Northbound</b>								
LT	689	1681	1.73	0.41	362.8	F	361.1	F
R	649	1583	0.01	0.41	17.5	B		
<b>Southbound</b>								

Intersection Delay = 262.0 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS  
 Agency: SPRAGUE & SPRAGUE  
 Date: 4/20/2006  
 Period: T/T PM PEAK  
 Project ID: FUTURE VOLUMES - 5-LANE BRIDGE + NB DL  
 E/W St: COLUMBIA AVENUE

Inter.: COLUMBIA/I-26 WB RAMP  
 Area Type: All other areas  
 Jurisd: CHAPIN  
 Year : 2025  
 N/S St: I-26 WB RAMP

*CGW255MTP*

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	0	2	0	1	1	1	0	0	0
LGConfig	L	T			TR		L	LT	R			
Volume	108	559			751	12	1141	1	6			
Lane Width	11.0	11.0			11.0		11.0	11.0	12.0			
RTOR Vol						0			0			

Duration	0.25	Area Type:	All other areas					
Signal Operations								
Phase Combination	1	2	3	4	5	6	7	8
EB Left	A				NB Left	A		
Thru	A				Thru	A		
Right					Right	A		
Peds					Peds			
WB Left					SB Left			
Thru	A				Thru			
Right	A				Right			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	25.0				25.0			
Yellow	3.5				3.5			
All Red	1.5				1.5			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	167	402	0.68	0.42	25.1	C		
T	1440	3456	0.41	0.42	12.5	B	14.5	B
<b>Westbound</b>								
TR	1422	3413	0.62	0.42	14.7	B	14.7	B
<b>Northbound</b>								
L	698	1676	0.85	0.42	25.8	C		
LT	700	1681	0.85	0.42	25.6	C	25.6	C
R	660	1583	0.01	0.42	10.3	B		
<b>Southbound</b>								

Intersection Delay = 19.3 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/CONNECTOR  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: AM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: CONNECTOR

SIGNALIZED INTERSECTION SUMMARY

*CU025RBA*

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	0	1	1	1	1	2	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	150	1400	150	350	600	250	50	200	450	100	100	50
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
WB Left	A	A			SB Left	A		
Thru	A	A			Thru	A		
Right	A	A			Right	A		
Peds					Peds			
NB Right	A				EB Right			
SB Right					WB Right			
Green		17.0	43.0			15.0		
Yellow		3.5	3.5			3.5		
All Red		1.5	1.5			1.5		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	234	490	0.71	0.48	28.5	C		
TR	1545	3234	1.12	0.48	84.9	F	79.9	E
<b>Westbound</b>								
L	403	1711	1.08	0.72	98.8	F		
TR	2258	3126	0.47	0.72	5.4	A	32.6	C
<b>Northbound</b>								
L	196	1175	0.29	0.17	33.6	C		
T	303	1818	0.73	0.17	44.4	D	34.1	C
R	636	1546	0.79	0.41	29.6	C		
<b>Southbound</b>								
L	117	703	0.95	0.17	104.2	F		
TR	545	3270	0.31	0.17	33.3	C	61.6	E

Intersection Delay = 54.8 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1d

Analyst: GGS Inter.: COLUMBIA/CONNECTOR  
 Agency: SPRAGUE & SPRAGUE Area Type: All other areas  
 Date: 4/20/2006 Jurisd: CHAPIN  
 Period: PM PEAK Year : 2025  
 Project ID: FUTURE VOLUMES - RECOMMENDED BASE  
 E/W St: COLUMBIA AVENUE N/S St: CONNECTOR

CC025RBP

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	0	1	1	1	1	2	0
LGConfig	L	TR		L	TR		L	T	R	L	TR	
Volume	100	800	100	450	1100	350	150	100	350	100	150	150
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas  
 Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		A			NB Left	A		
Thru		A			Thru	A		
Right		A			Right	A		
Peds					Peds			
WB Left	A	A			SB Left	A		
Thru	A	A			Thru	A		
Right	A	A			Right	A		
Peds					Peds			
NB Right	A				EB Right			
SB Right					WB Right			
Green	17.0	43.0			15.0			
Yellow	3.5	3.5			3.5			
All Red	1.5	1.5			1.5			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
<b>Eastbound</b>								
L	144	302	0.72	0.48	35.0+	D		
TR	1544	3231	0.61	0.48	18.0	B	19.7	B
<b>Westbound</b>								
L	508	1711	0.94	0.72	43.6	D		
TR	2275	3150	0.68	0.72	7.6	A	16.2	B
<b>Northbound</b>								
L	132	793	1.27	0.17	203.6	F		
T	303	1818	0.37	0.17	34.0	C	69.8	E
R	636	1546	0.61	0.41	22.6	C		
<b>Southbound</b>								
L	206	1234	0.54	0.17	37.2	D		
TR	530	3180	0.63	0.17	37.3	D	37.3	D

Intersection Delay = 27.9 (sec/veh) Intersection LOS = C