

Traffic Congestion Analysis

Town of Davidson NC

Town Board Work Session

January 12, 2016



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Traffic Congestion Analysis
Doug Wright, Public Works Dept.
January 12, 2016

Proposed Scope of Analysis

- Roundabouts
- Beaty St. – Griffith St. – Sloan St.
- Griffith St. - Main St.
- Main St. – Concord Rd.
- Main St. – South St. – Chairman Blake Ln.
- Others?



Definitions

- **Delay Time:** *average delay experienced by all vehicles that arrive in the analysis period. Includes movements at slower speeds and stops on intersection approaches as vehicles move up in queue position or slow down upstream of an intersection*
- **Queue:** *a waiting line especially of persons or vehicles*
- **AM Peak**
- **PM Peak**



Process for Analysis

- Set up camera at intersection, take traffic counts during AM and PM peaks
- Load counts into software, generate delay times and 85th percentile queue
- Intersections are graded A-F based on delay time and queue length
- Adjust signal timing or road configuration to relieve congestion



NCDOT Counts and Analysis

- Cameras set up in January 2016
- Analysis complete late March 2016
- Main-Griffith
- Main-Concord
- Main-South-Chairman Blake



2014

Beaty & Griffith

	MOE	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
1. Beaty Street & Griffith Street														
AM	LOS	E	F	A	B	C	C	F						
	Capacity (v/c)	-	1.07	0.39	0.01	0.81	0.68	1.18						
	Delay	56.8	75.2	7.7	14.5	22.1	23.8	125.4						
	95th %ile Queue	-	#337	117	7	194	117	#377						
SCHOOL PM PEAK	LOS	F	B	A	B	C	B	F						
	Capacity (v/c)	-	0.63	0.52	0.03	0.80	0.26	1.45						
	Delay	84.0	13.4	8.5	14.3	21.5	18.5	238.5						
	95th %ile Queue	-	72	145	11	243	70	#378						
PM	LOS	F	B	A	B	C	C	F						
	Capacity (v/c)	-	0.42	0.43	0.01	0.86	0.41	2.08						
	Delay	203.9	12.1	7.3	12.7	23.2	22.1	520.4						
	95th %ile Queue	-	46	141	7	330	#126	#695						

2014 Beaty–Griffith-Sloan Roundabout with Potts-Sloan Connection in Place

	MOE	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
1. Beaty Street & Griffith Street - Single Lane Roundabout														
AM	LOS	F	F			D			F			C		
	Capacity (v/c)	1.28	1.28			0.94			1.20			0.97		
	Delay	94.1	141.8			45.5			125.0			33.2		
	95th %ile Queue	-	2226			420			1037			636		
SCHOOL PM PEAK	LOS	D	D			B			B			F		
	Capacity (v/c)	1.10	1.03			0.74			0.51			1.10		
	Delay	43.9	45.9			13.3			13.7			73.6		
	95th %ile Queue	-	946			219			100			992		
PM	LOS	F	A			B			B			F		
	Capacity (v/c)	1.90	0.79			0.86			0.53			1.90		
	Delay	170.3	9.9			18.7			12.2			420.8		
	95th %ile Queue	-	318			370			106			4002		



2011 Main-Griffith and Main-South-Chairman Blake

Intersection	2011 Condition 1 – Existing Traffic Volumes	
	AM	PM
NC 115 (Main Street) / SR 2158 (Griffith Street)	B (18.5)	C (20.1)
NB LT	A (10.0)	B (12.2)
NB THRT	A (7.2)	A (8.9)
SB LTR	C (26.1)	C (28.8)
EB LT	C (23.5)	C (21.6)
EB RT	C (31.3)	C (30.5)
NC 115 (Main Street) / South Street / Chairman Blake Lane	F (154.1)	F (356.9)
NB LTR	C (33.4)	C (33.8)
SB LT	B (10.7)	A (9.5)
SB THRT	B (14.0)	B (11.2)
EB LTR	F (456.3)	F (711.3)
WB LTR	C (33.1)	C (33.5)



Main-Concord Oct. 2012

- **NCDOT Proposed 7-car queue**
 - **Potential loss of 9 parking spaces**
 - **NCDOT analyzed intersection using 2011 data**
 - **Questions about delay / queue analysis**



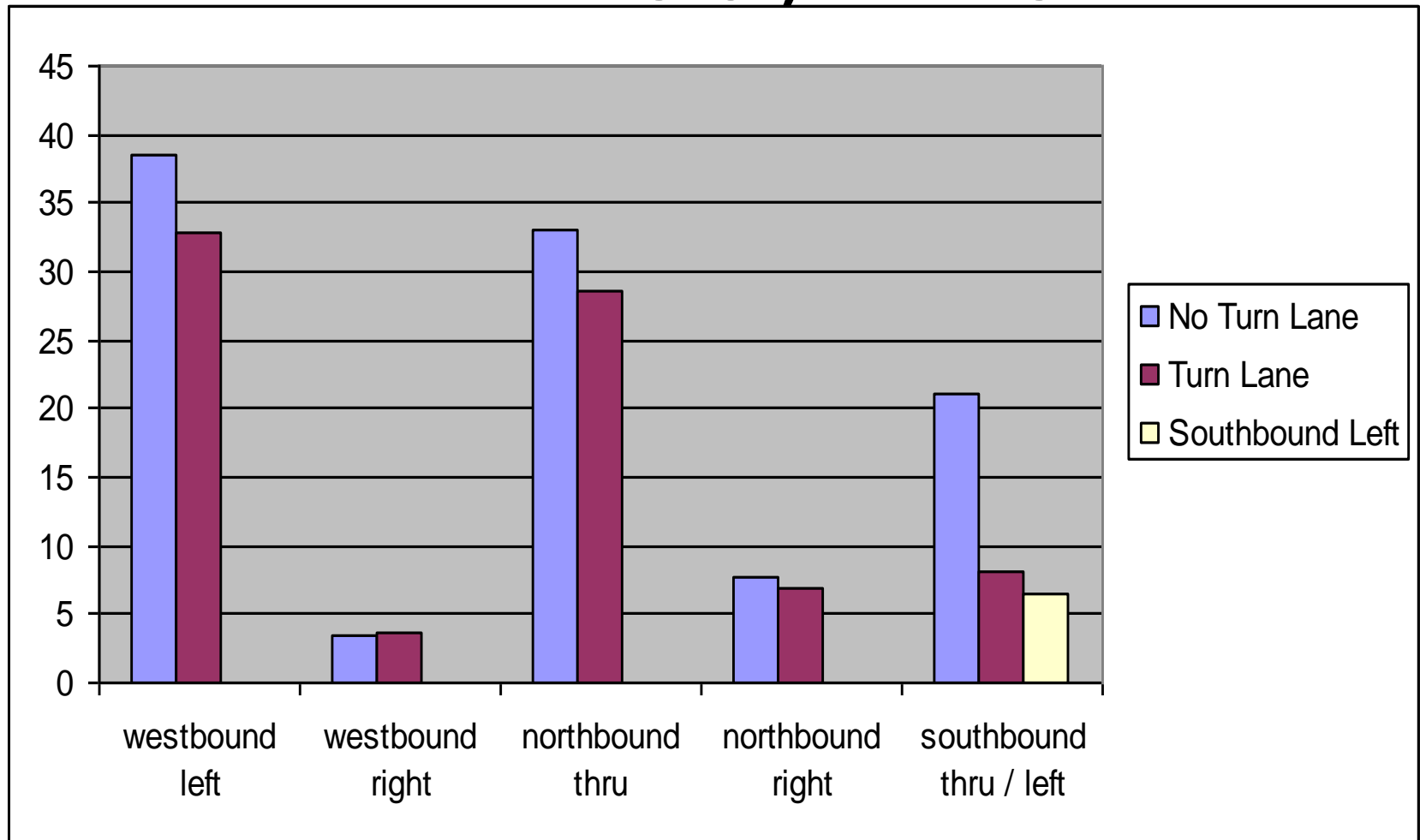
NCDOT Design



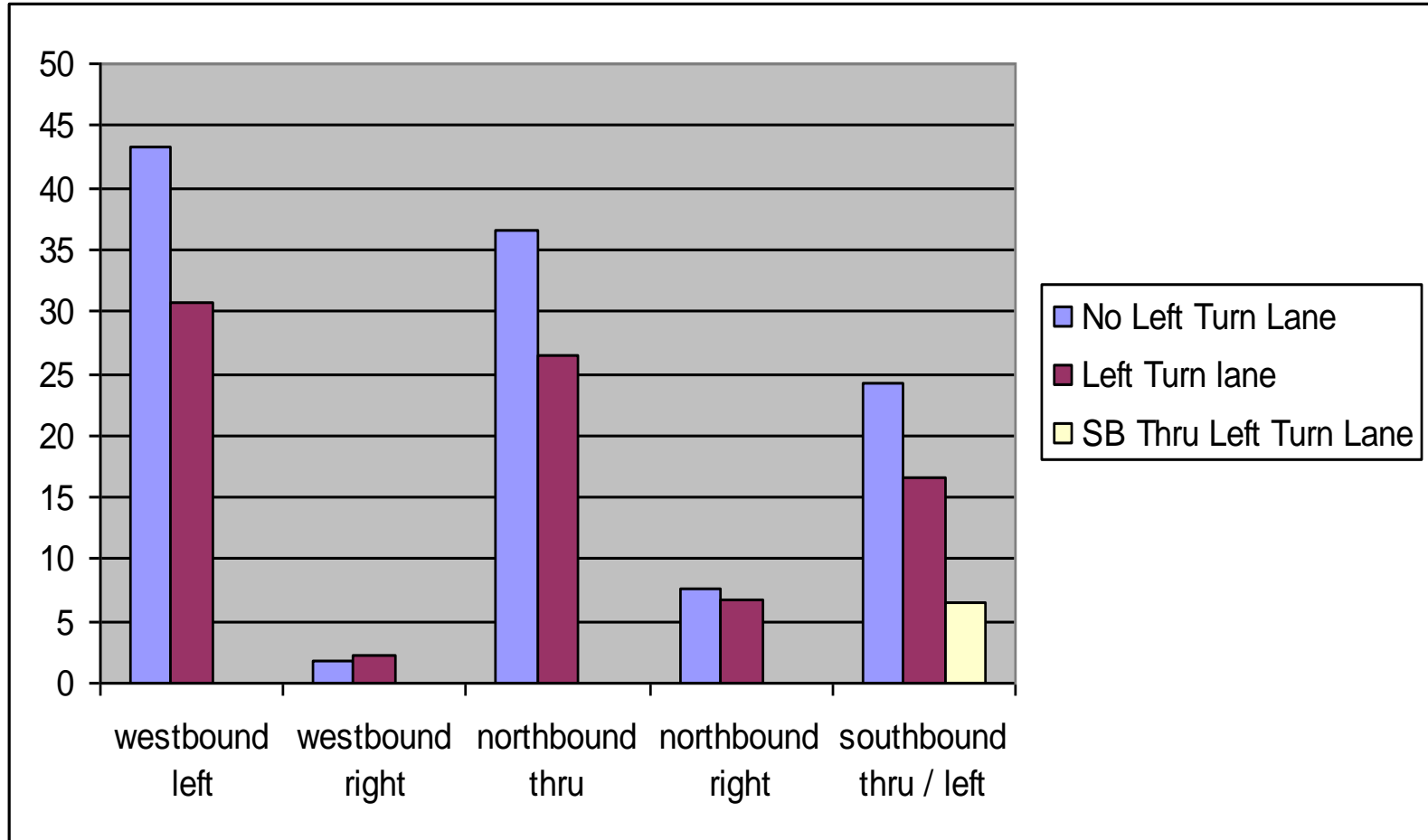
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AM Delay Time



PM Delay Time



Overall Intersection Analysis

- **Existing**
 - **AM 18.5 Seconds Delay**
 - **PM 22 Seconds Delay**
 - **Total 40.5 Seconds Delay**
- **With Left Turn Lane**
 - **AM 12.3 Seconds Delay**
 - **PM 14.2 Seconds Delay**
 - **Total 26.5 Seconds Delay**



The value of a parking space in Downtown Davidson is \$1600/day per space in sales (which includes retail, restaurant, and services)



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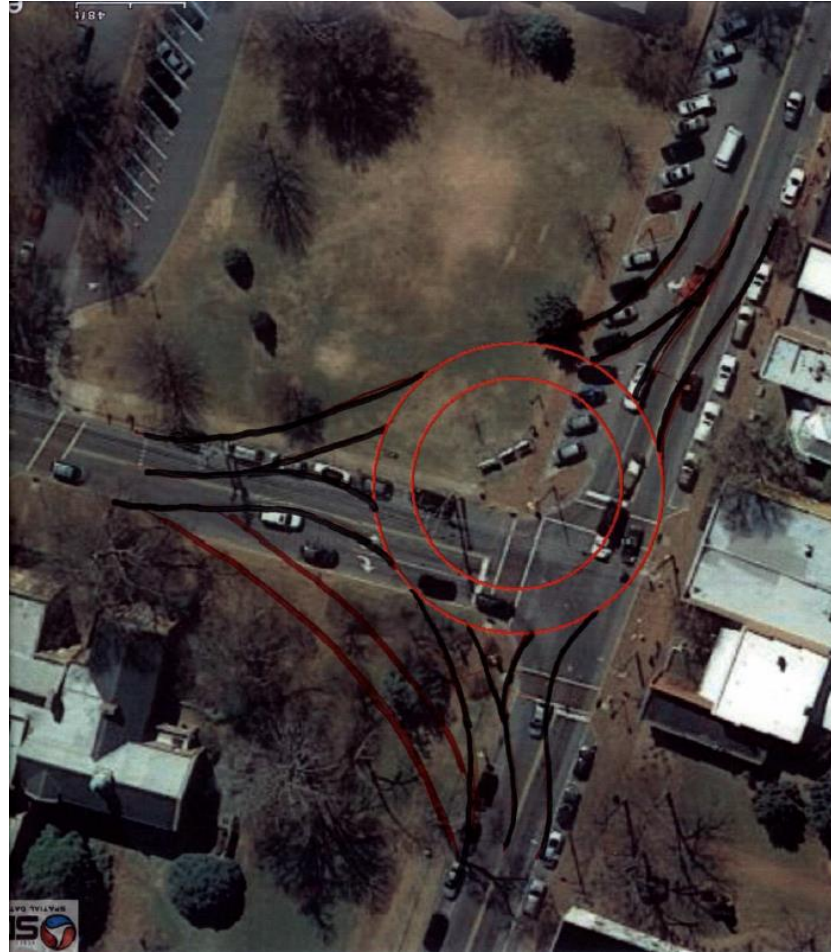
Google earth

Yearly Value of Parking Spaces

- **9 spaces**
- **\$1600 per space per day**
- **$9 \times \$1600 = \$14,400$ per day**
- **Mon-Sat = 312 days per year**
=\$4,368,000 per year



Main-Concord



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Next Steps

- **Determine service years of Potts-Beaty-Sloan Roundabout**
- **Provide best analysis for congestion improvement from extension of Main-Concord left turn lane**

