ATTACHMENT A

A RESOLUTION RECEIVING A REPORT ON DOWNTOWN TRAFFIC CONDITIONS
Draft Resolution No. 104/2011-12

WHEREAS, *Carrboro Vision 2020* declares that the "safe and adequate flow of bus, auto, bicycle and pedestrian traffic within and around Carrboro is essential", and;

WHEREAS, several approved or proposed development projects, capital projects, and planning processes affecting traffic in downtown Carrboro suggest a need to reflect on conditions for all of these modes;

WHEREAS, on November 1, 2011, the Board of Aldermen received a preliminary report on downtown traffic, including a summary of recommendations from plans, policies, and studies;

NOW, THEREFORE BE IT RESOLVED by the Carrboro Board of Aldermen that:

1. The Board receives the report.
2. The Board directs staff to follow up with additional traffic information as it is received and analyzed.
3. The Board provides the following comments or guidance:
    a. _____
    b. _____
    c. _____

This is the 13th day of March in the year 2012.

TOWN OF CARRBORO

NORTH CAROLINA

MEMORANDUM

DELIVERED VIA: ☐ *HAND* ☐ *MAIL* ☐ *FAX* ☒ *EMAIL*

DATE: **March 8, 2012**

TO: **Matt Efird, Interim Town Manager**
David Andrews, Incoming Town Manager
Mayor and Board of Aldermen

CC: **Christina Moon, Planning Administrator**
Patricia McGuire, Planning Director

FROM: **Jeff Brubaker, Transportation Planner** JSB

RE: **Report on Traffic in Downtown Carrboro**

Background

On November 1, 2011, the Board of Aldermen received a preliminary report on downtown traffic. The report summarized the recommendations of plans, policies, and studies relating to traffic in the downtown area, including those from Carrboro Vision 2020, the Downtown Traffic Circulation Study (2005), the New Vision for Downtown Carrboro (2001), the Carolina North Transportation Impact Analysis, and Carrboro Parking: An Exploratory Study (2008). The report also provided some preliminary intersection data collected as part of the traffic analysis of the Weaver Street Reconstruction project. Not all of the information provided at this meeting is repeated in this memo; however, some parts of it are reiterated here. The agenda materials may be found at the following link: http://townofcarrboro.org/BoA/Agendas/2011/11_01_2011.htm.

This memo builds on the November 2011 report and provides additional quantitative data on downtown traffic. As data are still being processed and analyzed, additional information not included below will be presented at the meeting.

Downtown traffic volumes

Traffic volumes on downtown road segments

Although Carrboro's population grew 17% between 2000 and 2010, traffic volumes in the downtown area have generally decreased over a similar period, according to average annual daily traffic (AADT) data collected every other year by NCDOT.

Figure 1 shows traffic volume changes at AADT locations from 1997 to 2009 and the total for all locations. The total for all locations uses a different axis, which is not shown. More important than the raw total is the change over time.

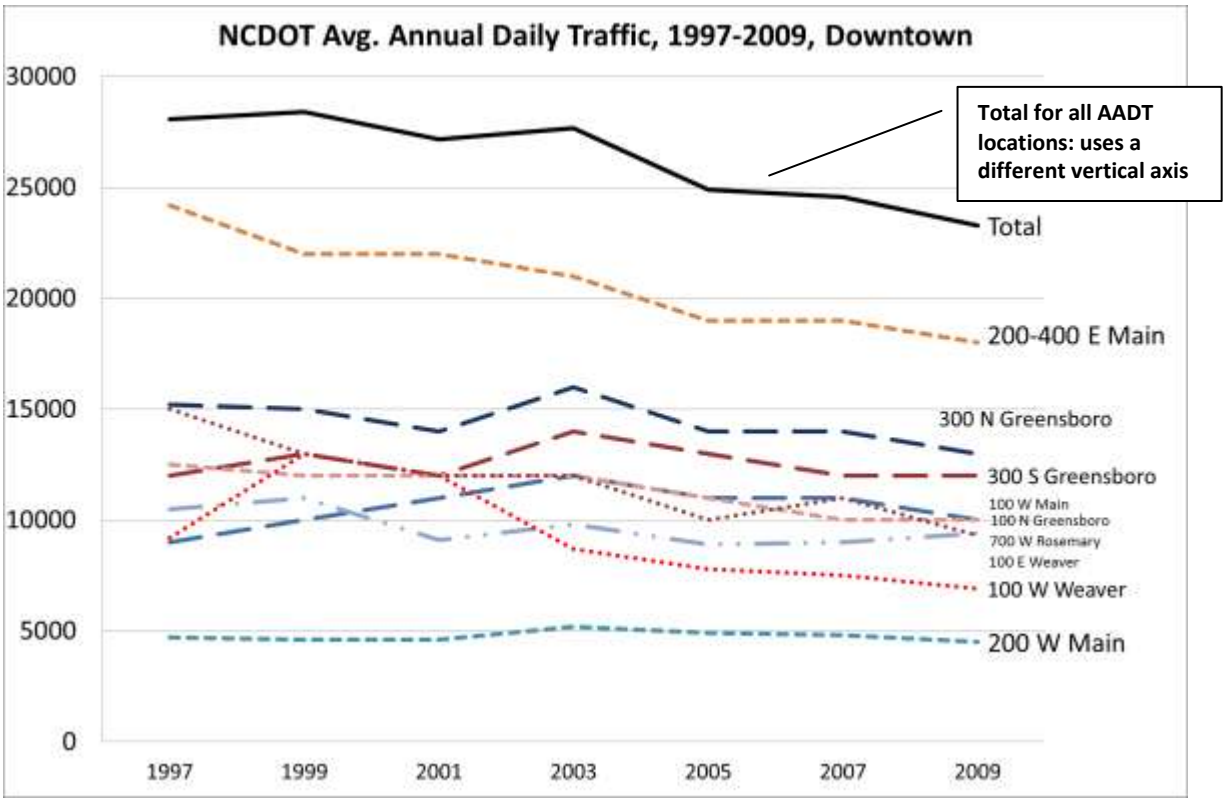

Figure 1. Average Annual Daily Traffic, downtown locations

Traffic volumes at downtown intersections

Peak intersection traffic volumes in 2011 and 2012 are presented below for the Main-Greensboro intersection. Additional intersection traffic volumes will be presented at the meeting.

Approved, proposed, and potential development trip generation

Although traffic volumes have generally decreased over the last 15 years, there is reason to be aware of a potential increase in traffic volumes due to trip generation from approved, proposed, and potential developments in downtown Carrboro and Chapel Hill, even as most of these developments would be expected to have significant transit, bicycle, and pedestrian trips.

Table 1 summarizes net new external auto trips for several approved, proposed, and potential developments in downtown Carrboro and Chapel Hill.

Project	**ADT**	**AM peak**	**PM peak**	**Notes**
500 N. Greensboro St.	795	41	59	
201 N. Greensboro St.	478	52	48	
East Main residential	474	39	45	
Roberson Square	1061	52	170	
Greenbridge*	2874	98	259	66% of traffic assumed to travel through Carrboro

Project	ADT	AM peak	PM peak	Notes
300 E. Main (buildout)	9391	641	909	
Alberta	995	44	61	TIA not completed for this development: used 500 N. Greensboro TIA; applied 34% internal capture to PM peak hour
Total	**16068**	**967**	**1550**	

Table 1. Net new external auto trips of approved, proposed, or potential developments in or near downtown Carrboro

From just these developments, after taking into account reductions for bike/ped/transit trips, internally captured trips, and pass-by trips, 16,000 net new external auto trips per day are projected, with 1,000 every AM peak hour and over 1,500 every PM peak hour.

Additionally, several developments have been approved or proposed in downtown Chapel Hill, within one mile of downtown Carrboro.

- **140 West Franklin** – 140 residential units, 26,000 square feet of ground-level retail space and 337 parking spaces – under construction.
- **Shortbread Lofts** – 85 residential units, 6,500 square feet of ground-level retail space and 121 parking spaces – approved.
- **University Square redevelopment** – 160 residential units, 40,000 square feet of retail, 300,000 square feet of office, 90,000 square feet of flex space, and 1,025 parking spaces – proposed.

UNC and Carolina North Trip Generation

Furthermore, some new auto trips can be expected starting in 2014 from the beginning of Carolina North development.

The Board reviewed the Fall 2009 Carolina North Transportation Impact Analysis (TIA) in detail on March 16, 2010. The TIA includes LOS analysis of some downtown Carrboro intersections based on background traffic growth rates and trip generation figures for various phases of buildout of Carolina North. That agenda item can be found at the following link: http://townofcarrboro.org/BoA/Agendas/2010/03_16_2010.htm. The information from this agenda item will not be repeated in full here; however, it is relevant to note the LOS projected for Carrboro intersections.

The Fall 2009 TIA used the following background traffic annual growth rates: 2% to 2015 and 1.25% from 2015-2030. Table 2 shows "build" scenario levels of service (LOS) at intersections in or near Carrboro for the two Fall 2009 TIA horizon years, assuming both mitigation (M) and non-mitigation (NM) scenarios. Downtown or near-downtown intersections are in bold.

		2015 Build				2030 Build			
	Intersection	**Morning Peak**		**Evening Peak**		**Morning Peak**		**Evening Peak**	
No.		NM	M	NM	M	NM	M	NM	M
26	Homestead/Seawell School					F	D	C	A

		2015 Build				2030 Build			
	Intersection	**Morning Peak**		**Evening Peak**		**Morning Peak**		**Evening Peak**	
No.		NM	M	NM	M	NM	M	NM	M
27	Homestead/Rogers	F	C	E	E	F	B	F	B
28	Homestead/High School					F	D	A	A
29	Old NC86/Homestead/Dairyland					F	D	D	C
31	Estes/Airport Dr.	E	E	F	F	F	C	F	C
32	Estes/Seawell Sch.	B	B	C	C	F	D	F	D
33	**Estes/Greensboro**					**E**	**D**	**F**	**D**
35	NC54/W. Main	C	C	C	C	C	C	C	C
37	**Greensboro/Weaver**	**C**	**C**	**D**	**D**	**E**	**D**	**F**	**F**
38	**Greensboro/Main**					**F**	**D**	**F**	**D**
39	**Greensboro/Merritt Mill**					**B**	**D**	**D**	**D**

Table 2. Projected 2015 and 2025 levels of service (LOS) for certain intersections in or near Carrboro in the Fall 2009 TIA with and without mitigation measures. LOS A = free flow traffic; LOS F = severely congested. Note: Some cells are blank because the TIA did not show the 2015 LOS for some intersections. Letters represent overall LOS for each intersection approach; LOS for an individual approach may be better or worse than the overall LOS. NM = No mitigation. M = Mitigation.

As can be seen, Estes/Greensboro, Greensboro/Weaver, and Greensboro/Main all operate at LOS F in the evening peak in 2030. Estes/Greensboro and Greensboro/Main return to LOS D with mitigations, but even with mitigations, Greensboro/Weaver is still at LOS F.

The mitigations proposed for these intersections by the TIA all involve adjusting signal timing. It should be noted that NCDOT has modeled, and the Town has requested through Local Priority Lists, that a roundabout be constructed at the Estes/Greensboro intersection.

Pedestrian considerations with signal timing

As has been described, a common traffic engineering method of reducing congestion is through changes in signal timing. It should be noted that while certain cycle lengths are favorable to automobile operations at intersections, pedestrians generally benefit from shorter cycle lengths, which may be at odds with the ideal cycle lengths only from an auto operations perspective. As noted in the *PEDSAFE* guide, "In general, shorter cycle lengths and longer walk intervals provide better service to pedestrians and encourage better signal compliance."[1]

Weaver Street Reconstruction

On October 12, 2010, the Board of Aldermen directed that staff "the Planning Department monitor the impacts of the street closings of East Weaver on Greensboro Street and Main Street to provide information for future planning on downtown traffic circulation." Planning and Public Works staff collected segment count and intersection turning movement data before, during, and after the Weaver Street Reconstruction (WSR) project. Automated traffic counters were deployed to collect segment data on Main and Weaver Sts., and turning movement count (TMC) data was collected manually by Planning and Public Works staff.

Due to limited resources and staffing, the TMCs were limited to the PM peak hour (4:00 to 6:00 pm) at the corner of Main St. and Greensboro St. TMCs were taken on four different Wednesdays corresponding to different WSR phases.

- Feb. 16, 2011 – Before project: Weaver St. fully open to traffic

[1] http://www.walkinginfo.org/pedsafe/pedsafe_curb1.cfm?CM_NUM=39.

- Apr. 20, 2011 – During project: E. Weaver St. fully closed to traffic
- Oct. 12, 2011 – During project: W. Weaver St. fully closed to traffic
- Feb. 15, 2012 – After project: Weaver St. fully open to traffic

This intersection was selected because it was identified as being on the detour route of Main St. No other east-west routes exist in the vicinity. NC-54 bypass is 0.6 miles to the south, Estes Dr. is 0.6 miles to the north, and Homestead Rd. is approximately 3 miles (as the crow flies) to the north.

For each count, bicycle and pedestrian data was collected as well. Overall intersection traffic volumes are presented in Figure 2, Figure 3, and Figure 4.

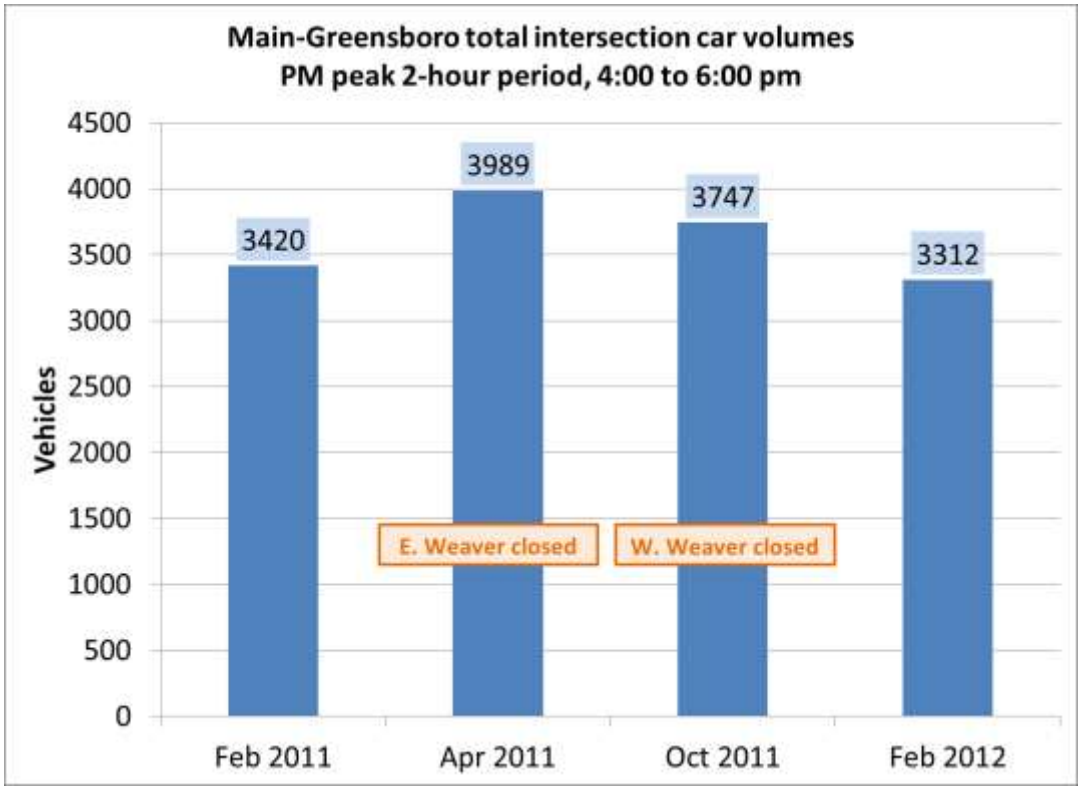

Figure 2. Automobile traffic and Main St. and Greensboro St., 2011-2012.

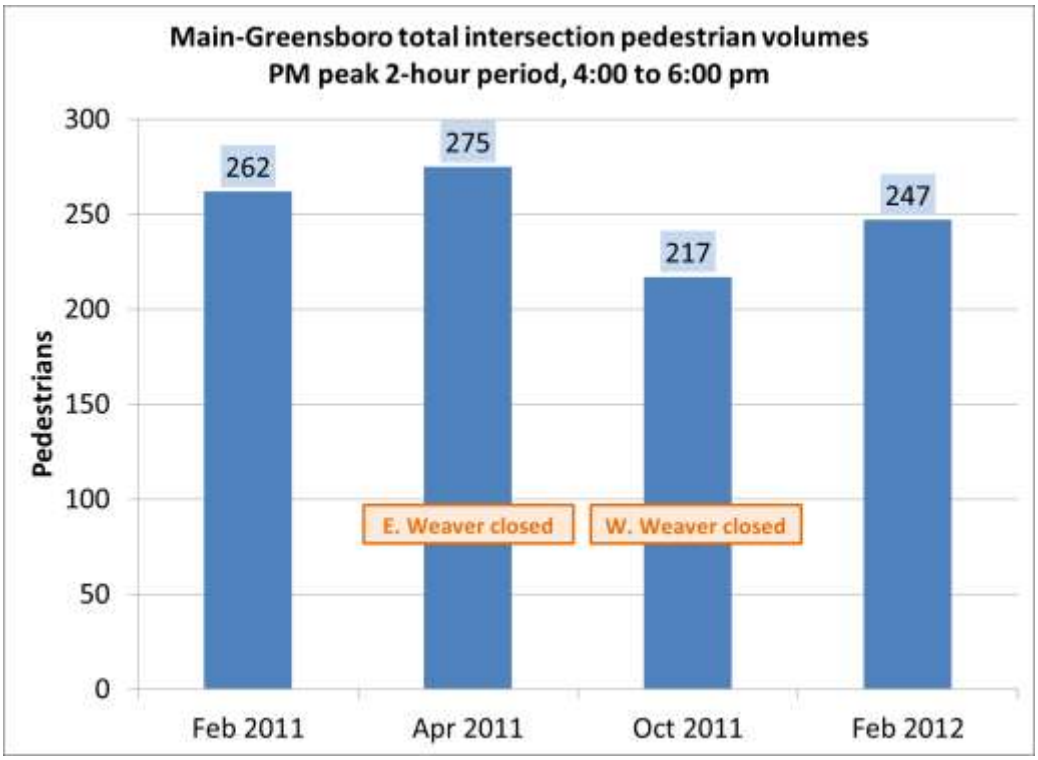

Figure 3. Pedestrian traffic and Main St. and Greensboro St., 2011-2012.

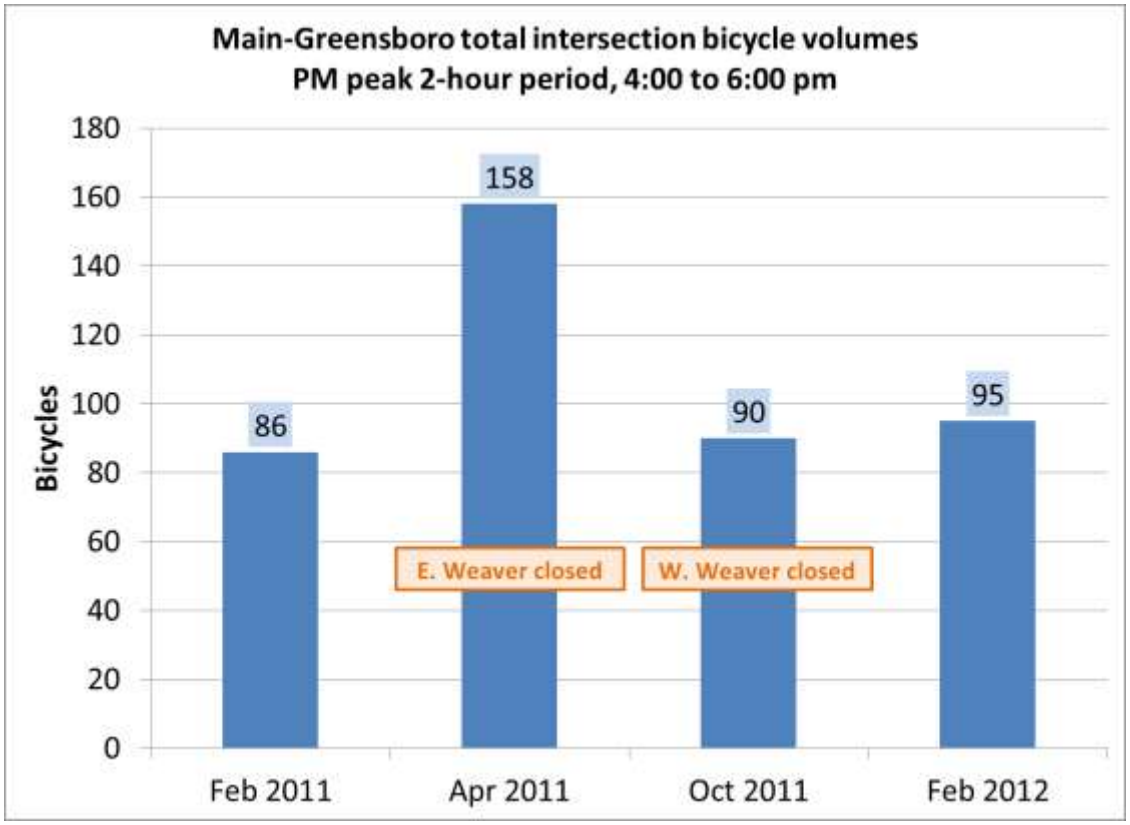

Figure 4. Bicycle traffic and Main St. and Greensboro St., 2011-2012.

The graphs show that, as expected, traffic volumes increased by 17% (569 additional autos) from February 2011 to April 2011, during the closure of E. Weaver St. From April to October, they decreased by 6% to 3,747 as E. Weaver St. reopened and W. Weaver St. was closed, but volumes were still about 10% higher than the February 2011 baseline. In February 2012, after Weaver St. was fully opened again, there were 108 less cars than in February 2011, a 3% decrease.

Pedestrian and bicyclist volumes were the highest in April 2011, with a substantial number of bicyclists compared to the other three count times. This can be attributed in part to the season, although each count was conducted when there was no precipitation.

Turning movements affected by the Weaver Street Reconstruction Project

As expected, certain turning movement volumes at the Main-Greensboro intersection changed dramatically during the closure of E. Weaver St. as motorists took detours on Main St. The figures below depict some of the more marked turning movement changes from February 2011 to April 2011.

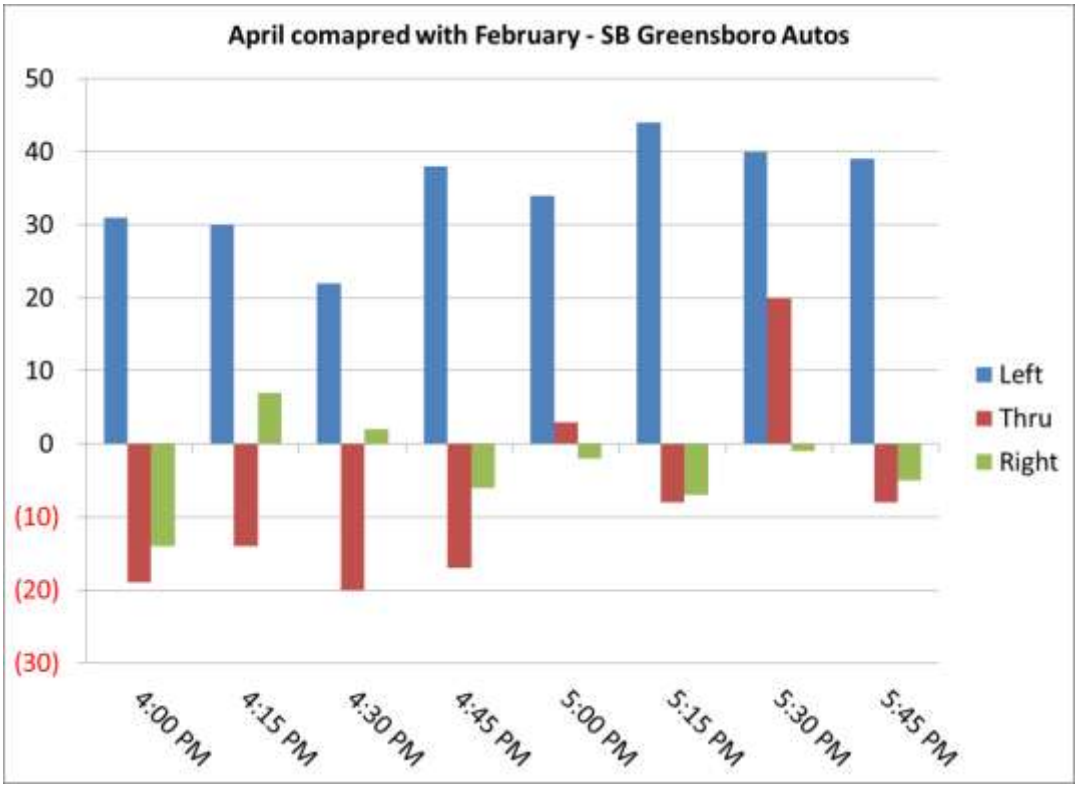

Figure 5. Southbound left turns from Greensboro onto Main increased by 20-45 for each 15-minute interval

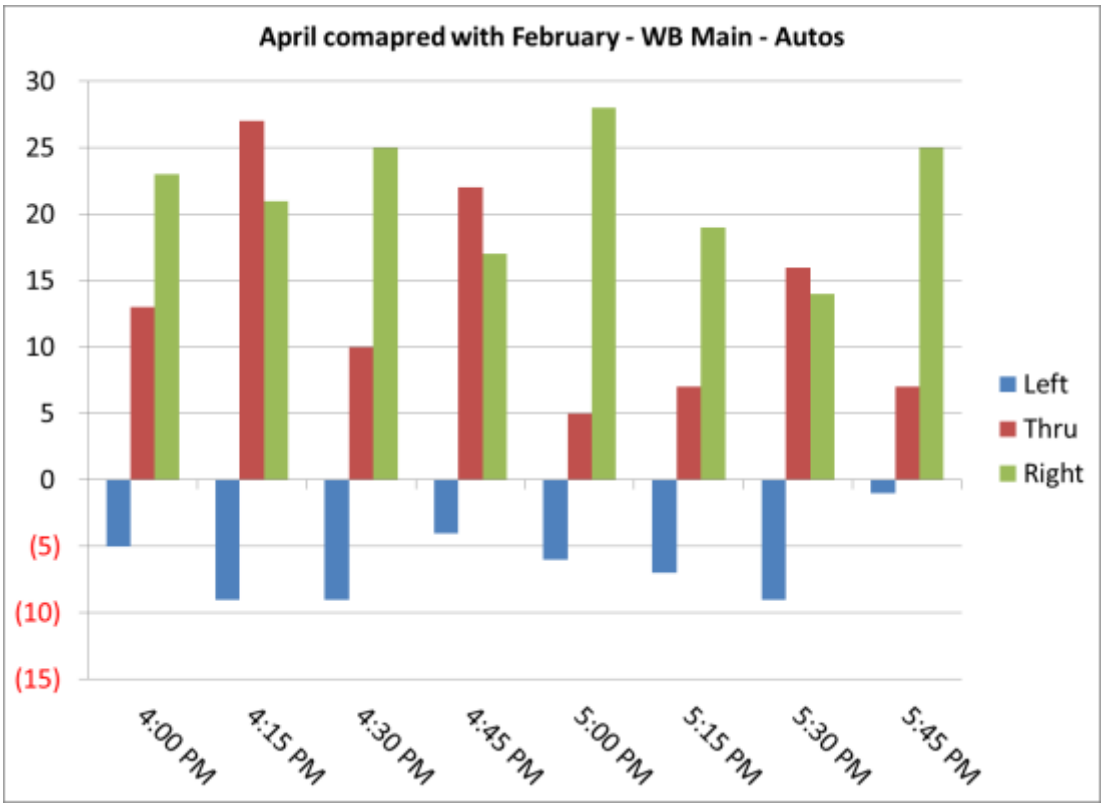

Figure 6. Westbound through and right-turning traffic from Main St. increased consistently across intervals.

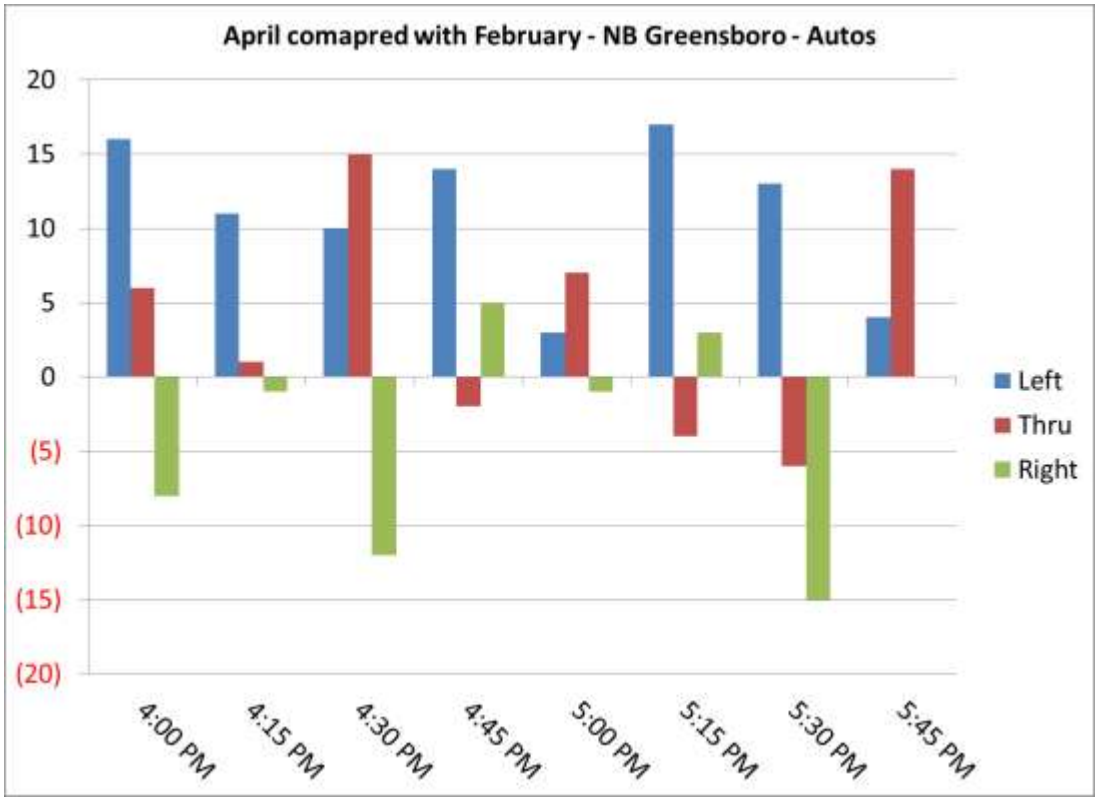

Figure 7. Northbound left turns from Greensboro onto Main increased consistently across intervals.

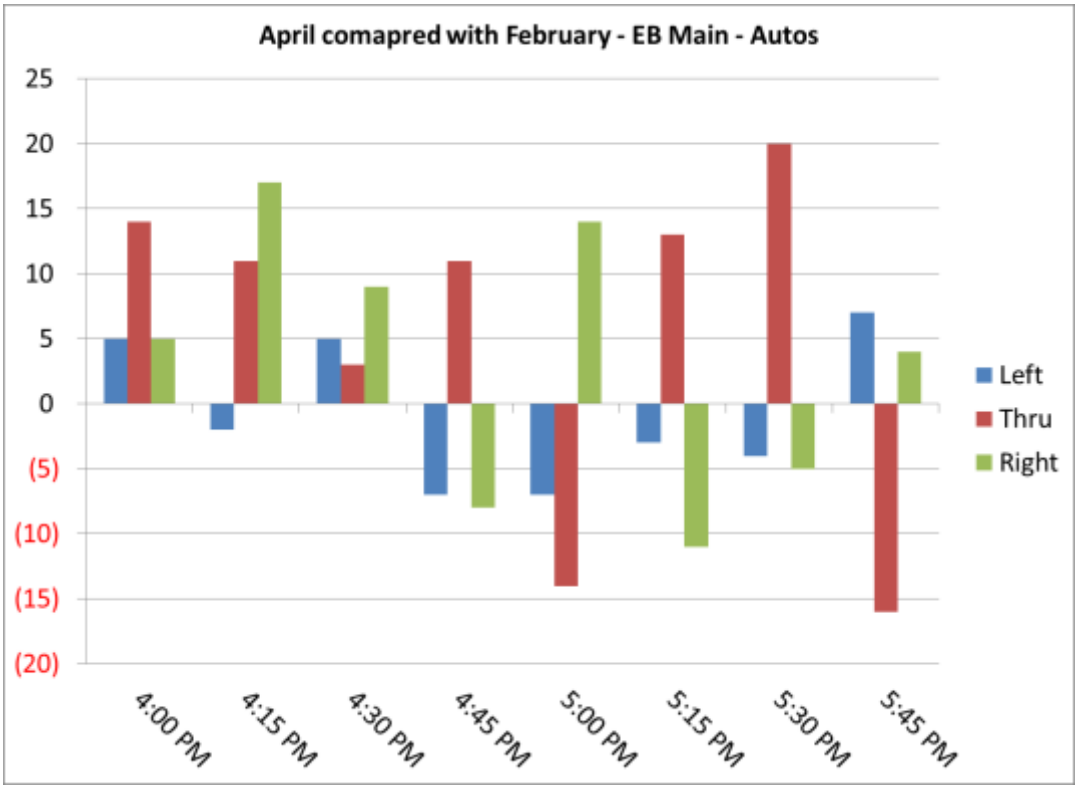

Figure 8. The data for eastbound traffic on Main St. is more equivocal.

Additional information on individual turning movement changes will be presented at the meeting. At the time of writing, an LOS analysis of the intersection using Synchro software is ongoing. Preliminary LOS results are expected to be presented at the meeting.