TOWN OF CARRBORO

NORTH CAROLINA

MEMORANDUM

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

DATE: **March 11, 2014**

TO: **David Andrews, 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 – Part 4**

Background

This is the fourth in a series of reports to the Board of Aldermen on traffic in downtown Carrboro. Previously:

- A November 1, 2011, report summarized the recommendations of plans, policies, and studies relating to traffic in the downtown area. The report also provided some traffic data relating to the Weaver Street Reconstruction project. Agenda materials are available here: http://townofcarrboro.org/BoA/Agendas/2011/11_01_2011.htm.
- A March 13, 2012, report summarized downtown traffic volume trends; trip generation potential from approved, proposed, and potential developments; and additional data relating to the Weaver Street Reconstruction and its effect on the Main-Greensboro intersection. Agenda materials are available here: http://townofcarrboro.org/BoA/Agendas/2012/03_13_2012.htm.
- A February 12, 2013, report focused on downtown intersection level of service (LOS), an initial step at addressing what level of congestion downtown Carrboro intersections may face after buildout of approved developments and a modest background traffic growth rate of 1%.

Also, in January 2013, the Board received a report on the impact on Main St. level of service (LOS) of closing Weaver Street for an event. The report included details on how traffic changed for the Weaver Street Reconstruction and traffic volumes on weekend days. Agenda materials are available here: http://townofcarrboro.org/BoA/Agendas/2013/01_22_2013.htm.

This report presents additional information on intersection delay provided by RSTS, who was contracted by the Planning Department to provide technical review of the Town's Synchro

model of downtown traffic. The Synchro model is a work in progress, with new volume information being added as new traffic data becomes available and development statuses change.

Methodology

The model and traffic volumes reflecting future year buildout maintained by Town staff were sent to RSTS, who revised the model as needed. These volumes are for the PM peak hour. The AM peak hour generally has lower traffic volumes (although individual movements are in some cases higher). These data include 1% background growth rates. While background growth rates may not seem to be the most appropriate given evidence that average daily traffic has not increased, and in fact has decreased, since the late 1990s, they are intended to generally account for additional traffic generated by other developments, such as those in downtown Chapel Hill that are either under construction or approved. The data also include specific developments in Carrboro where the development outlook has recently changed; despite these changes, someday the sites can be expected to be developed, adding trips to the downtown network. In summary, the model results have a margin of error, but are overall useful in gauging the approximate congestion issues during the PM peak hour at downtown signalized intersections.

Intersection delay and queue length statistics are averages.

Main St./Franklin St./Merritt Mill Rd./Brewer Ln.

Approach volumes

- Intersection delay: 1445 sec. / veh. (worst of intersections studied)
- Queue length: 749 ft. (3rd worst of intersections studied)

Notes

- The 300 E. Main St. revised TIA (December 5, 2007) projected that at full buildout the intersection would operate at LOS D, with the northbound (Merritt Mill) approach operating at LOS F. Hotel guests and others who park in the parking deck may access it from NC-54 via Merritt Mill Rd. / Main St., thus adding trips to this intersection.
- The Greenbridge TIA projected LOS F for the intersection and two approach lanes, and LOS E for two others.
- This intersection was found to have the third-worst future (2030) PM peak delay (LOS F) of all intersections studied in the 2005 Downtown Circulation Study.
- Town staff and staff from the Town of Chapel Hill met on August 29, 2013, to begin discussion of information and challenges with this intersection.
- Under construction and approved developments in the western part of downtown Chapel Hill will add vehicular trips to this intersection.

Main St. and Lloyd St.

Approach volumes

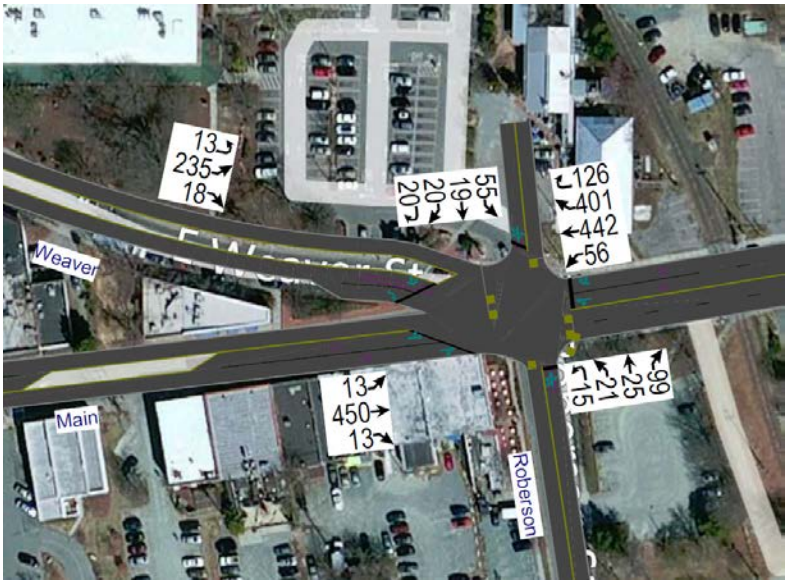
- Intersection delay: 540 sec. / veh. (3rd worst)
- Queue length: 387 (ranked 5th)

Notes

- Town staff and RSTS have found larger delays and worse LOS from modeling this intersection. However, the 300 E. Main developer's engineering consultant has maintained that intersection LOS is will still be LOS B.
- An August 2012 memo from Main Street Properties' engineering consultant proposed signal timing revisions that have now been implemented. The memo's recommendations are summarized in the Feb. 2013 memo. The recommended timing was an attempt to accommodate both the significant through volumes and left turns from E. Main St. without widening to add left turn storage. It found an intersection signal delay of 17.9 seconds (LOS B) but also found that the westbound 95th percentile queue length exceeded the length of the segment between signalized intersections. This suggests what can be sometimes be anecdotally observed in the PM peak hour, which is a line of cars stacked from this intersection back beyond the Main-Rosemary intersection.
- Town staff have received two comments from citizens concerned about congestion and delay at this intersection.
- The intersection is being improved to a four-way approach as part of the Fleet Feet building construction.
- 300 E. Main buildout obviously is a significant factor in this intersection's traffic volumes and operation. Consideration of how the proposed performing arts center at E. Main-Roberson affects traffic at this intersection is an important factor.
- >60 sec. delay was observed by Town staff in calling the pedestrian signal at the crosswalk across Main St. Several pedestrians were observed crossing against the light, evidence that longer delays in calling the pedestrian signal will encourage such behavior.
- A delivery tractor trailer was observed making an eastbound right turn into the 300 E. Main driveway. The swept path of the truck took up the entire driveway width. This suggests that, when four-way operation begins, right turning trucks may conflict with northbound vehicle queues and may back up the eastbound E. Main St. approach. However, this could be confirmed via a discussion with the developer's engineer.
- An approved signal plan modification for this intersection, developed by the Town's bike loop detector project consultant, shows bike loop detection added at this intersection. However, funding has not yet been identified to make this improvement, as the budget for bike loop detection is being devoted to other intersections.

Main St./Weaver St./Roberson St./Carr Mill Mall driveway

Approach volumes



- Intersection delay: 203 sec. / veh. (3rd ranked of 7 signalized intersections studied)
- Queue length: 687 (ranked 5th of 7)

Notes

- This intersection was found by the August 2012 Main Street Properties memo to experience LOS D under the preferred signal phasing scenario for the Main-Lloyd intersection. The source of the most delay was the southeastbound left turn from E. Weaver St. to Main St., which was LOS F (137.5 seconds of delay).
- Consideration of how the proposed performing arts center at this intersection affects traffic and pedestrian volumes is an important factor.
- Identified for bike loop detection installation.

Main St. and Greensboro St.

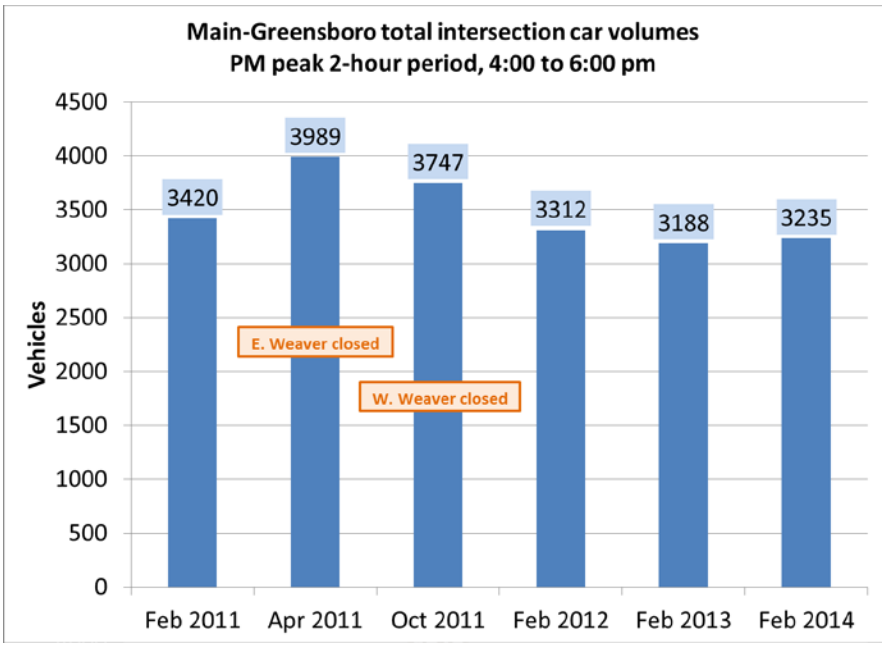
Approach volumes

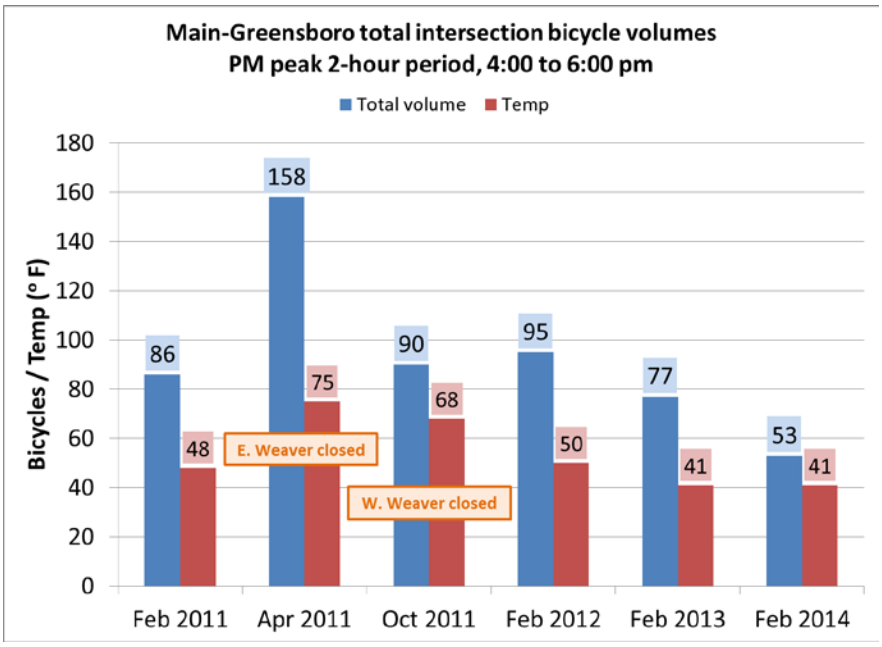
- Intersection delay: 143 sec. / veh. (3rd best of 7 signalized intersections)
- Queue length: 514 ft. (4th of 7)

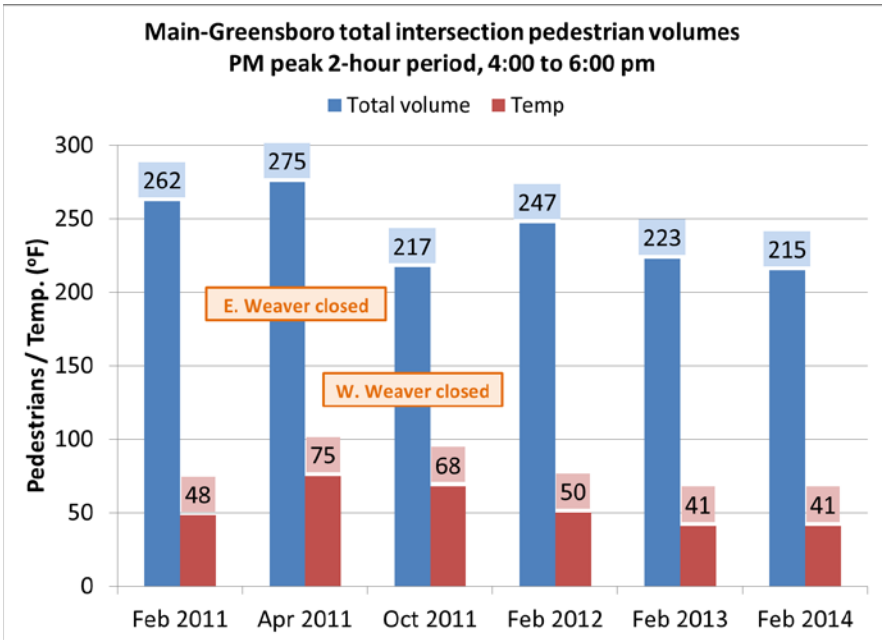
Notes

- Town and TIA analyses have shown LOS C or better for this intersection. However, anecdotally, staff have observed occasional longer queues, including northbound queues backing up from Greensboro-Weaver into the intersection, and this intersection leading to southbound back-ups into the Greensboro-Weaver intersection.
- A TIA conducted for the 501 S. Greensboro St. (South Green / Rogers-Triem) development application showed LOS D at the intersection at buildout in 2016 (39.5 sec. intersection delay)
- A bike loop detector has been included in the bike detection project to accommodate the significant NBL movements from cyclists

PM peak hour counts conducted by Town staff from Feb. 2011 to Feb. 2014 are shown in the graphs below. These include two other 2011 counts related to the Weaver Street Reconstruction traffic analysis.

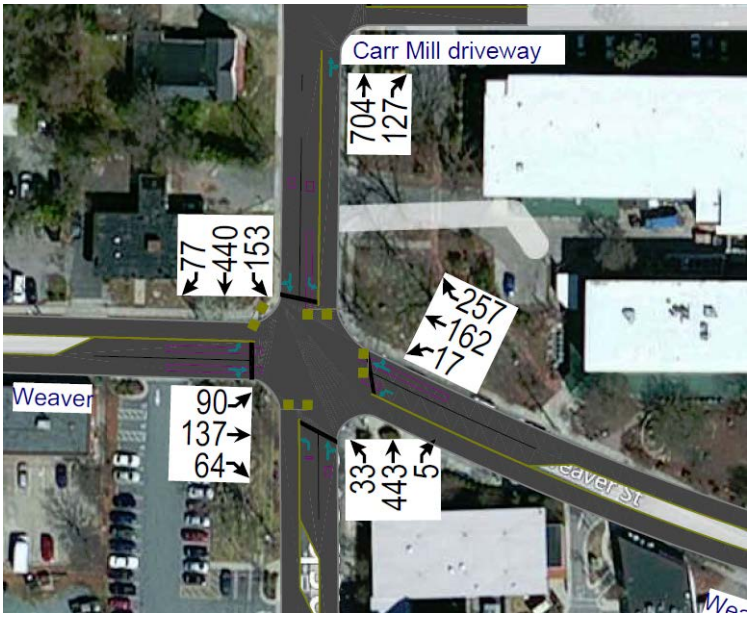

Main-Greensboro total intersection car volumes
PM peak 2-hour period, 4:00 to 6:00 pm
Vehicles
4500
4000
3500
3000
2500
2000
1500
1000
500
0
3420
3989
3747
3312
3188
3235
E. Weaver closed
W. Weaver closed
Feb 2011
Apr 2011
Oct 2011
Feb 2012
Feb 2013
Feb 2014


Main-Greensboro total intersection bicycle volumes
PM peak 2-hour period, 4:00 to 6:00 pm
Total volume
Temp
Bicycles / Temp (° F)
180
160
140
120
100
80
60
40
20
0
86
48
158
75
90
68
95
50
77
41
53
41
E. Weaver closed
W. Weaver closed
Feb 2011
Apr 2011
Oct 2011
Feb 2012
Feb 2013
Feb 2014



Greensboro St. and Weaver St.

Approach volumes



- Intersection delay: 62 sec. / veh. (2nd best of 7 signalized intersections)
- Queue length: 329 ft. (4th of 7)

Notes

- This intersection has been modeled at LOS C or D overall, but the westbound right-through approach is the most congested, and has been modeled at a worse LOS.

- A lead pedestrian interval may be considered to allow pedestrians crossing the southbound approach better pedestrian LOS; however this would require changing the sequence of the signal cycle, potentially lagging the eastbound protected left-turn phase after the eastbound-westbound through green interval. This could also further affect the westbound right-through LOS. Further engineering study should be done before pursuing this option.