

A RESOLUTION RELATING TO A CONCEPT FOR MODIFYING
THE LANE CONFIGURATION ON WEST MAIN STREET FROM WEAVER
STREET TO HILLSBOROUGH ROAD

Draft Resolution No. 56/2010-11

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

WHEREAS, the segment of West Main Street between West Weaver Street and Hillsborough Road is four lanes; and,

WHEREAS, the Carrboro Downtown Traffic Circulation Study (2005) recommends modifying this segment to one through lane in each direction with on-street parking on one side and bike lanes on both sides (assuming intersection capacity increasing with a modern roundabout at Weaver Street); and,

WHEREAS, the Carrboro Comprehensive Bicycle Transportation Plan (2009) recommends the following: “Stripe bicycle lanes along this stretch of Main St. with the implementation of a road diet, converting existing four lanes to two travel lanes, a central turn lane, and striped bicycle lanes on both sides of the roadway”; and,

WHEREAS, properly implemented “classic road diets” – converting roads from four lanes to three (including a center turn lane) – have been found to reduce crash frequency and motor vehicle speeds, as well as invite greater bicycle and pedestrian use while having insubstantial effects on traffic operations for streets with average daily traffic under 15,000 to 20,000; and,

WHEREAS, road diets reduce the number of lanes pedestrians and left-turning vehicles must cross; and,

WHEREAS, this segment of West Main Street is the site of a substantial number of bicyclists, pedestrians, and transit users; and,

WHEREAS, West Main Street is maintained by the North Carolina Department of Transportation (NCDOT);

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

1. The Board of Aldermen receives the staff report and presentation;
2. [Alternatives]
 - a. The lane configuration on West Main Street between Weaver Street and Hillsborough Road should remain in its current form.
 - b. The Board of Aldermen expresses interest in further examination of a “road diet” on West Main Street between Weaver Street and Hillsborough Road resulting in two through vehicle lanes, a center turn lane, and bike lanes.

[If alternative 2b is preferred]

3. Town staff are directed to prepare a letter to NCDOT conveying the Board's interest in the road diet concept and requesting that it be considered at the time of resurfacing.
4. Town staff are directed to conduct an analysis of traffic and safety impacts of road diet implementation and present the analysis to the Board of Aldermen by May 1, 2011, and work with NCDOT on other necessary implementation steps.
5. If the traffic and safety analysis shows no substantial traffic operations or public safety impacts, a pavement marking plan in accordance with the road diet concept described above shall be prepared and submitted to NCDOT by June 30, 2011.

This is the 11th day of January in the year 2011.



TOWN OF CARRBORO

NORTH CAROLINA

MEMORANDUM

DELIVERED VIA: ☐ HAND ☐ MAIL ☐ FAX ☐ EMAIL

DATE: December 15, 2010

TO: Steven Stewart, Town Manager
Mayor and Board of Aldermen

CC: Patricia McGuire, Planning Administrator
George Seiz, Public Works Director

FROM: Jeff Brubaker, Transportation Planner

RE: West Main Street Lane Configuration

Purpose

This memorandum provides staff comments on the Transportation Advisory Board's presentation of a "road diet" concept for West Main Street from West Weaver Street to Hillsborough Road.

Background

Two adopted Town plans recommend various improvements to W. Main St. between Weaver St. and Hillsborough Rd. The Downtown Traffic Circulation Study (2005) recommends modifying W. Main St. to one through lane in each direction; adding on-street parking on one side and bike lanes on both sides; and providing increased intersection capacity with a modern roundabout (pp. 19-20). The Comprehensive Bicycle Transportation Plan (2009) makes the following recommendation:

Stripe bicycle lanes along this stretch of Main St. with the implementation of a road diet, converting existing four lanes to two travel lanes, a central turn lane, and striped bicycle lanes on both sides of the roadway. (p. 3-33)

The plan notes that this was a very high priority among participants at public meetings, calling the segment a "critical gap between existing bicycle facilities" (See *Attachment E*).

In March 2010, the Transportation Advisory Board (TAB) began discussing implementation strategies, should the Town seek to pursue these recommendations. Near this time, NCDOT engineers verbally advised that the Town should make its preference for W. Main St. known to NCDOT. This preference may be considered at such time as when W. Main St. is included on NCDOT's annual resurfacing schedule. The TAB has adopted a recommendation which is included in *Attachment C*.

Traffic impact

Road segment

Average daily traffic (ADT) just south of the Weaver-Hillsborough segment was 4800 in 2007. Just north of it, ADT was 4600. (Traffic on the actual segment itself may be somewhat higher. This can be confirmed with traffic counts.) Roadway capacity varies based on several factors, but generally urban arterials have a capacity range of about 300-750 vehicles *per hour per lane* – closer to 300 for level of service (LOS) A and 750 for LOS E. Assuming D is the minimum acceptable LOS, capacity would be 675 veh/h/lane. A cross-section with two through lanes – one in each direction – would by this standard have a capacity of 1350 veh/h. Making a common assumption that peak hour travel is about 10 percent of daily travel, W. Main St. carries about 460-480 auto trips in the peak hour, counting both directions. This is roughly one-third of the hourly capacity estimate. A center turn lane may serve to further improve capacity. The 2005 Mobility Report Card listed the following 24-hour, two-way capacity figures for W. Main St.:

- Between James St. and Simpson St.: 12,900
- Between Blackwood Dr. and Fidelity St.: 18,300
- Between Weaver St. and Jones Ferry Rd.: 13,700

The first and third figures show W. Main St.'s capacity as a two-lane road without a center turn lane. The above information suggests that traffic volumes fall considerably short of the proposed, two-lane/center-turn-lane capacity. Simulation with traffic modeling software could provide a more definitive picture of W. Main St.'s LOS. Staff recommend that this be carried out to measure the substantial negative impacts, if any, to auto traffic operations if the road diet were implemented.

Intersection

The table below shows the 2005 Mobility Report Card's report of the peak-period LOS for the W. Main-W. Weaver intersection.

Time of day	2003	2005
AM Peak	A	A
Mid-day Peak	A	B
PM Peak	A	C

The Downtown Traffic Circulation Study found that the W. Main-Weaver intersection operated at LOS B in the peak hour (2003-04 data), suggesting uncongested conditions even during the heaviest traffic volumes. Projecting out to 2030, the study found the intersection would still operate at LOS B, although delay would rise. An alternative scenario modeling the intersection with a recommended roundabout instead of the existing traffic signal showed that LOS improved to A for both the baseline (2003-04) and projected (2030) traffic volumes. One scenario that would produce congestion at the intersection would be 2030 volumes assuming Weaver St. and Main St. were made a one-way pair: LOS F would occur at the PM peak (as with most other intersections downtown).

It should be noted that LOS at intersections is not influenced only by the LOS of the approaching street segments. It is also affected by factors such as signal timing, adjacent land uses, number of driveways, and other factors.

A recent study of road diets by the Federal Highway Administration's Highway Safety Information System states:

Under most annual average daily traffic (AADT) conditions tested, road diets appeared to have minimal effects on vehicle capacity because left-turning vehicles were moved into a common two-way left-turn lane (TWLTL) [i.e. center turn lane]... However, for road diets with AADTs above approximately 20,000 vehicles, there is an increased likelihood that traffic congestion will increase to the point of diverting traffic to alternative routes.¹

W. Main St.'s traffic volume is roughly one-fourth of the 20,000 threshold.

Safety

A "classic road diet" converting four lanes to three w/center turn lane can reduce the risk of three different vehicle crash types²:

1. *Rear-enders*, e.g. through vehicle crashing into the back left-turning vehicle waiting to turn. The center turn lane separates left-turning vehicles from through vehicles. On the Weaver-Hillsborough segment, there are at least 12 opportunities to turn left from the left through lane.
2. *Sideswipes*, e.g. vehicle is waiting to turn left from left through lane. Trailing vehicle changes to the right lane to avoid running into the left-turning vehicle. In changing lanes, the vehicle sideswipes another vehicle going through in the right lane. The center turn lane preempts the need to change lanes to avoid a car stopped to make a left turn.
3. *Left turn/broadside*, e.g. in a four-lane cross-section, two vehicles facing each other are waiting to make left turns at the same intersection. They may block each other's view of through vehicles in the right lanes. One left-turning vehicle may decide to go, without seeing the through vehicle, and get broadsided. A center turn lane would align the two left-turning vehicles and give them a better angle to see if there are any through vehicles coming towards them.

Figure 1 shows the crash types.

¹ FHWA, Highway Safety Information System (2010). Evaluation of Lane Reduction "Road Diet" Measures on Crashes: Summary Report. FHWA-HRT-10-053. <http://www.tfhrc.gov/safety/hsis/pubs/04082/index.htm>.

² Pedestrian and Bicycle Information Center. (2010). "Road Diets" webinar with Peter Lagerwey. http://www.walkinginfo.org/training/pbic/dps_webinar_11-03-2010.cfm.

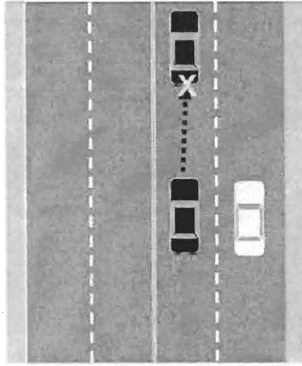
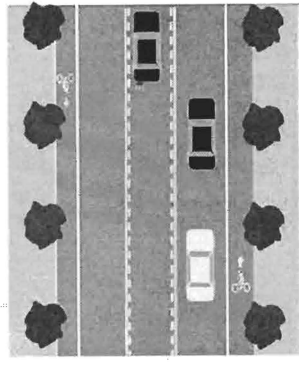
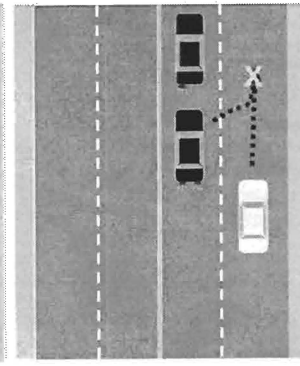
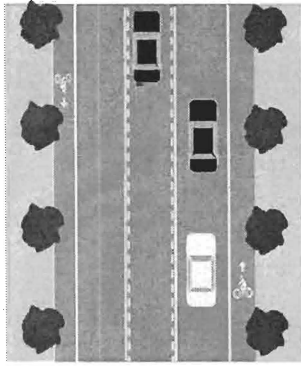
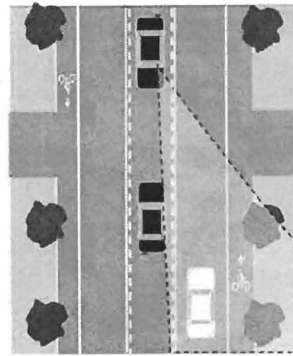
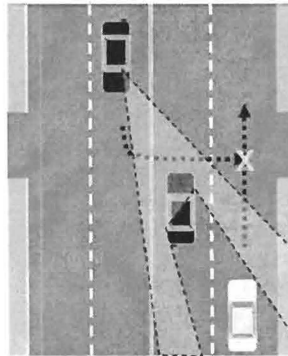
1 – rear enders**2 – side swipes****3 – left turn/broadside**

Figure 1. Three types of crashes whose risk may be reduced by a road diet. Source: Adapted from “Road Diets” PBIC webinar (Peter Lagerwey).

Research on road diets in California, Washington, and Iowa show an overall 29 percent reduction in vehicle crashes.³ Bike lanes separated from traffic are provided and the number of lanes pedestrians must cross is decreased. A classic road diet in Orlando, FL, resulted in lower crash frequency and crash-related injuries and higher pedestrian and bicyclist volumes.⁴

The 2005 Mobility Report Card found that average speeds on the W. Main St. segment were below the posted speed limit, although higher than 2003 speeds. On W. Main St. between Blackwood Dr. and Fidelity St., the report found 702 pedestrians and 378 bicyclists over a 12-hour period in 2005.

Road diet examples in Durham

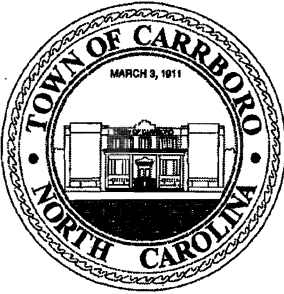
Road diets have been implemented in Durham on State-maintained roads such as Erwin Rd., W. Chapel Hill St., and University Dr./Lakewood Ave. In these cases, NCDOT asked for a letter from the Durham City Manager stating the City’s support for the road diets. Durham’s engineering staff also prepared pavement marking plans for submission to NCDOT.

Traffic and Parking Committee review

The staff-level Traffic and Parking Committee discussed the road diet concept on November 23, 2010. No substantial issues with the concept were raised at the meeting.

³ FHWA/HSIS (2010).

⁴ PBIC (2010).



TOWN OF CARRBORO

TRANSPORTATION ADVISORY BOARD

RECOMMENDATION

November 18, 2010

SUBJECT: West Main Street road diet

MOTION: The Transportation Advisory Board recommends that the Board of Aldermen direct staff to work with NCDOT to implement a road diet on the four-lane section of West Main Street. Road diets are a cost-effective way to provide safety for all users, enhance aesthetics of the street, provide space for bike lanes, and allow safe crossing for pedestrians, all without decreasing traffic capacity. With minimal investment, a Main Street road diet would accomplish one of the goals of the adopted Carrboro Bicycle Plan.

Moved: Brown

Second: Perry

VOTE: Ayes (7): Hileman, Brown, Perry, LaJeunesse, Krasnov, Michler, Pergolotti. Nays (0). Abstain (0). Absent (0).

Jeffery S. Blh
for

Charlie Hileman
TAB Chair

12 / 15 /10
DATE



TOWN OF CARRBORO
301 W. Main St.
Carrboro, NC 27510

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West Main Street

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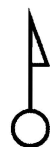




Fig. 3-22. W. Main St.'s proposed facilities include a road diet and bicycle lanes on both sides.

West Main Street: from Jones Ferry Rd. to Hillsborough Rd.

Importance

- Very high priority among public participants
- Important connection between Downtown area, Farmers Market, and residential areas
- Critical gap between existing bicycle facilities

Recommended Solution

Stripe bicycle lanes along this stretch of Main St. with the implementation of a road diet, converting existing four lanes to two travel lanes, a central turn lane, and striped bicycle lanes on both sides of the roadway.

**Construction projects considered to be innovative; will require state and federal approval for permission to experiment with these types of treatments*



Intersection Improvements:

- Main St. and Jones Ferry Rd.
 - Widen entrance to PTA bike path and paint directional arrows for turn lane (see photo rendering below)
 - Stripe and paint bicycle boxes* on Jones Ferry Rd.
 - Stripe and paint bicycle boxes* on Main St.
 - Paint colored bicycle lanes* connecting PTA bike path to future bicycle lanes on W. Main St.



Fig. 3-23. The PTA bike path and Main St./Jones Ferry Rd. intersection is very much in need of improvement. Constructing a turn lane on the bike path would discourage bicyclists from using the sidewalk along Main St.

traffic calming effect. This would preclude left-turn movements into the Harris Teeter lot which should occur at the northerly Harris Teeter driveway.

- Install specialty paving through the intersection of Greensboro and Shelton Streets as a district gateway treatment.
- Eliminate the second southbound lane between Shelton Street and Short Street in order to calm traffic and enhance pedestrian safety at crosswalks. A left-turn lane should be maintained at one of the Harris Teeter driveways (preferably the northernmost).
- Redesign the Fitch Lumber entrance to align with the future street along the abandoned rail right-of-way, eventually connecting with Lloyd Street.
- Construct a sidewalk on the west side of Greensboro Street from the bus stop that is just north of Shelton Street to the dentist office that is just north of Weaver Street, a distance of about 1,000 feet. Easements would be needed from Fitch Lumber and six residential properties. Existing street trees could be used as the verge, with construction of the sidewalk built between the street trees and existing buildings.
- Turn stormwater grates to the bicycle-friendly position and resurface as needed to remove ruts and rough edges between the grates and surrounding concrete.

I. East Main Street Redesign — There is an imminent opportunity to work with the redevelopment of the Arts Center site to analyze traffic levels of service using the design concept of eliminating one travel lane in each direction (there are currently two in each direction between Rosemary and the railroad tracks) and resurfacing / restriping East Main Street with one through lane in each direction, one striped bicycle lane in each direction, and an intermittent left-turn lane at intersections. Traffic signal timing should be adjusted at Lloyd Street to maximize throughput of traffic on Main Street, permit right-turns on red from southbound Lloyd Street and install presence detectors under the pavement on Lloyd Street so that right-turn traffic does not trigger a change in the traffic signal (only left turns would trigger the change to green). At Rosemary Street and Main Street, a realignment is recommended that would “T” Rosemary Street into Main Street at roughly a 90-degree angle. The realignment would require acquisition of two on-site parking spaces from the new Padgett Station coffee house, however their driveways on both Main and Rosemary should remain and the store should receive a waiver from the parking requirement. New on-street parking on Rosemary Street would more than make-up for the loss of two on-site spaces. There is a crash history at this intersection, attributed in part to the acute angle at which these streets intersect. The traffic signals at this intersection would have to be repositioned and retimed to avoid longer queues on Main Street (which are possible with the narrowing to one lane in each direction). Queue lengths on Rosemary Street will increase over existing conditions. New crosswalks should be marked one each across Main Street and Rosemary Street using high-visibility type longitudinal markings. There will be an area where asphalt pavement can be removed and replaced with landscaped public space adjacent to the intersection. There are currently several large shade trees that could provide shade over a nice public seating space.

J. Town Hall Roundabout — The Town should pursue \$400,000 to plan, design, construct and acquire a small amount of right-of-way to replace traffic signals with a modern roundabout at the intersection of West Main/Laurel/Weaver Streets. Currently there is little congestion and no recurring crash history to be concerned about, however, the following benefits may be achieved with the conversion:

- Shorter and safer pedestrian crossings
 - Changing left-turn movements into low-speed right-turn yield maneuvers, thus increasing the relative safety for motorists and passengers
- Increasing street capacity for cars that will permit changing Main Street to one lane in each direction. This will free-up space on the west side of Main Street just north of the roundabout to provide on-street parking. The additional parking will support events at the Farmers Market and Town Hall.
 - Free-up space on Main Street and Weaver Street to provide interconnected bicycle lanes. There is currently a gap in the striped bicycle lanes along West Main Street from Hillsborough Road to Jones Ferry Road. That gap could be closed with conversion to modern roundabouts.

- K. Jones Ferry Roundabout** — Following the successful conversion at the Town Hall roundabout, the Town may want to complete the West Main Street redesign by converting traffic signals to a modern roundabout at West Main Street/Jones Ferry Road. Benefits similar to the Town Hall roundabout would accrue and may spark some revitalization for existing businesses in the vicinity. West Main Street between the two roundabouts can be redesigned to provide one lane in each direction with one striped bicycle lane in each direction and intermittent on-street parking.
- L. Hosiery Street Extension** — The Town should initiate community meetings to sketch ideas and parameters under which Hosiery Street or a parallel alignment could be extended across the railroad mainline and use the right-of-way of the old rail spur linking to Greensboro Street. At Greensboro Street, the driveway to Fitch Lumber would be reconstructed to align with the new street along the rail tracks and the adjacent Harris Teeter driveway would be closed on Greensboro Street and relocated to the new street extension. An alternate alignment would traverse the field immediately south of the existing inbound driveway serving the Carrboro Community Health Center. On the west side of the railroad tracks, the right-of-way is roughly 25 feet wide which is sufficient to provide a two-lane two-way street. The street could be used by locals as an alternative to Main and Weaver Streets. The new connection also could enhance business for Harris Teeter so consideration should be given by the Harris Teeter property owner to permit a sidewalk easement on the south side of the new street. The benefit of such a street connection would be local accessibility across the railroad tracks saving local citizens time as they avoid peak hour congestion on Main, Weaver and Greensboro Streets. It would also enhance the safety of pedestrians and bicyclists who may currently cross the tracks without the benefit of a formalized crossing. Traffic calming features can be integrated into the design of this street connection to ensure reasonable travel speeds that may discourage usage by “through” traffic.
- M. Gateway Roundabout** — The Town should work with the Town of Chapel Hill to discuss opportunities to enhance the border intersection at Franklin Street/East Main Street/Merritt Mill Road/Brewer Lane. If and when any adjacent property owners announce plans to redevelop a corner site, the Town should initiate discussions of converting the signalized intersection to a modern roundabout. There is insufficient right-of-way to effect the conversion today, and less than compelling justification to use eminent domain; however if a willing property owner is interested in the opportunity that a public investment in street improvements might bring to their property value, then the Town should be ready to talk.