



# CITY OF CONCORD

## REPORT TO THE MAYOR AND CITY COUNCIL

**FROM:** Robert J. Mack, PE, PTOE, Traffic Engineer

**DATE:** March 28, 2012

**SUBJECT:** Report from Engineering Services Division on the McKee Square Intersection Improvement Study (CIP 31).

### **Recommendation**

Accept this report recommending that City Council approve the roundabout option including related street and sidewalk improvements for McKee Square and program design and construction of improvements in the FY2013-2022 Capital Improvement Program.

### **Background**

CIP 31 was initially authorized by Council in FY2000 as a result of traffic improvements recommended by Vanasse, Hangen, Brustlin, Inc. (VHB) in their 1990 Traffic Operations Improvement Plan for the City of Concord. Needed primarily to address high crash history at the Broadway/West intersection, CIP 31 originally envisioned installation of traffic signals at the Broadway/West intersection. During the same period, the needed replacement of aging signal equipment at the Broadway/Clinton/South intersection was also programmed under CIP 283 Traffic Signals and Traffic Operations Improvements.

In FY 2010, Council authorized \$40,000 to prepare a comprehensive engineering study of the McKee Square area with recommendations intended to minimize congestion and improve safety by: adding lane capacity at the intersections; providing orderly turning and through-traffic movement capability; and developing pedestrian access and crosswalk improvements. A concurrent area study, the 2008 Safe Routes to School Travel Plan for the Conant Elementary School and Rundlett Middle School, also indicated the need for pedestrian and safety improvements at McKee Square.

Engineering Services conducted the engineering study of the McKee Square area with findings and recommendations included herein. Findings have also been reviewed with the Traffic Operations Committee (TOC), the Transportation Policy Advisory Committee (TPAC), the Parking Committee, Ward Councilors (Wards 5, 6 and 7), and business owners/operators in the McKee Square area. A public information meeting on this project was held on December 8, 2011. CIP 31 is currently scheduled for design in FY 2013 and construction in FY 2014, subject to final approval by City Council.

## Discussion

An Executive Summary for the McKee Square Intersection Improvement Study is attached and includes graphics and tabular summaries of key study findings. While a brief synopsis of the study is provided below, it may be helpful to refer to the Executive Summary for more detail.

The project study area generally includes South Street from Avon Street to Downing Street, Broadway from Humphrey Street to South Street, and Clinton Street from South Street to S. Spring Street. The McKee Square intersection area is a major travel hub in the South End with a number of traffic-operational issues including: peak-hour volumes at the traffic signal of about 2,000 vehicles per hour; peak-period intersection operation near or at capacity with long traffic queues; frequent pedestrian crossings; increased walk-to-school use particularly following the school consolidations; high accident history at the Broadway/West intersection (averaging about 7 crashes per year for the last five years with most occurring during traffic peaks and involving West Street vehicles crossing Broadway through standing traffic queues and being impacted from the right by Broadway vehicles leaving the signals at Broadway/Clinton/South); difficult driveway access to abutting businesses; and location of McKee Square within a high-density residential area.

Staff compiled comprehensive traffic count data at study-area intersections, including business driveways, in 2009 and 2010. Data was collected during the school season and included morning and afternoon peak-period vehicle movements as well as pedestrians and bicycles. Vehicle and pedestrian movements in the square were also adjusted to reflect changes due to the area school consolidations. For traffic operation analysis and design purposes, area traffic projections were developed for a 2010 base year and a 2030 design year. A nominal area traffic growth of about one percent per year was assumed for purpose of the study, a conservative estimate as area traffic growth over the past decade has been minimal. For purpose of base maps and concept design, the City's planimetric data base including 2010 aerial photography was utilized to minimize study cost.

As summarized in the attached Executive Summary, staff considered a range of potential improvement options including a do-nothing alternative, low-cost options to prohibit turns and crossing traffic at the Broadway/West intersection, and full intersection reconstruction options with signals or roundabouts. Within this range of options, three alternatives were selected for detailed evaluation: a Keep Existing Operation alternative limited to a maintenance upgrade of the aging signals at Broadway/Clinton/South; a Lane Widening and Revised Signal alternative for Broadway/Clinton/South including extending a median to close off cross-traffic from West Street and widening Broadway to provide an second northbound through lane at the signal; and a Roundabout alternative for Broadway/Clinton/South with a combination of one- and two-lane roundabout approaches. Both of the intersection improvement alternatives included sidewalk and curb improvements around the square to improve sidewalks, shorten crosswalks, and provide improved lane delineation for bicycles.

The Lane-Widening alternative extends the raised medians on Broadway and Clinton Streets to prohibit street crossings from West Street and from side streets and driveways in the area of S. Spring Street. Broadway is widened for a second westbound through lane from West Street to the Broadway/Clinton/South intersection, with the westbound two lanes merging back together on Clinton Street near S. Spring Street. New signals would be installed at Broadway/Clinton/South with revised signal operation and updated pedestrian

signals. Notable disadvantages of the lane-widening signal option include increased cut-through traffic on nearby residential streets, higher speed operation particularly in the area of the proposed westbound two-lane merge on Clinton Street, and more complex driveway access for a number of businesses.

The Roundabout alternative essentially reconstructs the area of the Broadway/Clinton/South intersection with a modern roundabout. The roundabout requires additional lanes and would be larger than the roundabout at the Liberty/Centre/Auburn intersection. Some impacts to City property are anticipated on three of the four intersection corners, and a small impact may occur at the Citizens Bank property to close the existing entrance from South Street to accommodate a pedestrian crossing at the roundabout. About eight public parking spaces would be lost, although on-street space is available for some replacement. Simulations of peak-period traffic operation indicate superior operation with the roundabout alternative which was able to more efficiently process heavy vehicle flows with shorter traffic queues and lower speeds. Reduction of Broadway traffic queues will allow safer traffic movement from West Street. Existing access to businesses is generally maintained, and is enhanced in some instances by the U-turn capability a roundabout can provide.

Concept-level estimates of design and construction cost for the alternate are: about \$150,000 for the Keep Existing alternative (replace/update signal equipment at Broadway/Clinton/South); about \$660,000 for the Lane Widening/Revised Signalization alternative; and about \$860,000 for the Roundabout alternative. Note that the two improvement alternatives include sidewalk and curb improvements throughout the square as well as full pavement resurfacing. Funding is currently programmed from Transportation Impact Fees and General Obligation Bonds.

The current configuration and operation of the Broadway/Clinton/South intersection was funded and constructed by the New Hampshire Department of Transportation (formerly New Hampshire Department of Public Works and Highways) in the early 1980's. The associated Maintenance and Encroachment Agreement for this project between the State and City stipulates that any future changes to intersection traffic control will be subject to approval by the State and Federal Highway Administration.

Study findings were presented to and considered by the following committees:

- TOC (June 21, 2011). The committee indicated a strong preference for the roundabout alternative, with the keep-existing option a second interim choice in the event project funding is delayed.
- TPAC-Pedestrian (June 16, 2011). The subcommittee unanimously agreed that the roundabout alternative was the most desired.
- TPAC-Bike (July 25, 2011). The committee preferred the roundabout option with further consideration of bike ramps and a shared use path (i.e. 10-ft sidewalk) around the perimeter to accommodate bicyclists who are uncomfortable "taking the lane".
- TPAC (July 28 2011). The committee endorsed the roundabout option and noted this type of project is a gateway treatment project for the South End.
- Parking Committee (June 16, 2011). The committee endorsed the roundabout option as the preferred alternative. The committee also expressed interest in potentially

divesting itself of the public parking area it maintains (through the Parking Fund) on the small corner parcel adjacent to Citizen's Bank.

In the summer of 2011, staff also met with individual owners/operators of businesses adjacent to McKee Square in the square to describe the project and alternatives and get feedback from the business community. All indicated a preference for the roundabout alternative rather than the lane-widening and revised signal alternative. One owner preferred a do-nothing alternative to reduce city spending. Another owner hoped for a different alternative that would provide more direct driveway access for shops along Broadway currently restricted by the raised median.

Engineering Services hosted a public information meeting on December 8, 2011 at the Rundlett Middle School (meeting notes attached). The well-attended meeting of nearly 40 residents, staff and officials was generally supportive of improvements to McKee Square. Based on comments received from attendees, the roundabout alternative appeared preferable to an expansion of the signalized intersection because of potentially improved area traffic operation and context-sensitivity to the neighborhood characteristics of the McKee Square area. The roundabout alternative did, however, generate a number of questions and concerns as to vehicle and pedestrian operation and safety as this alternative would result in a significant change in traffic operation over existing conditions.

### **Recommendation**

Staff recommends that City Council approve the roundabout option including related street and sidewalk improvements for McKee Square and program the design and construction of improvements in the FY2013-2022 Capital Improvement Program. This creative and well-reviewed alternative: responds to the traffic operation and safety needs of the square; reflects a 'complete streets' design by integrating vehicle, pedestrian and bicycle modes; offers a context-sensitive design for neighborhood compatibility; enhances the South End by providing a 'gateway' treatment at this major travel hub; and conforms to the stated objectives of the City's Comprehensive Transportation Policy.

RJM/rjm

Attachments: Executive Summary, Public Information Meeting Notes

cc: Chip Chesley, General Services Director  
John Duval, Police Chief  
Dan Andrus, Fire Chief