



CITY OF CHICO MEMORANDUM

TO: To: CITY COUNCIL DATE: November 2, 2010
FROM: From: CPSD- TOM Z. VARGA FILE:
SUBJECT: CLOSURE OF THE NORD HIGHWAY BRDGE OVER MUD CREEK

Purpose:

This summary is intended to inform the City Council and staff handling this situation with background information. The City's point of contact will be Tom Varga, the Capital Project Services Director: 879-6900 or tvarga@ci.chico.ca.us .

Location:

In the northwest part of town, Nord Highway crosses over Mud Creek about a half mile west of The Esplanade at the City Limits. This bridge and road were added to the City in 2006 as part of the Northwest Chico Annexation.

Background:

The bridge was inspected by Caltrans bridge engineers in July of this year. It is classified as a "scour critical" bridge. This is a bridge where the creek under it is washing away part of the stream bed that holds up the bridge. In this particular location, several piles supporting piers (pole-like concrete "legs"), have been exposed by stream bed erosion. One pile has been exposed by up to eight feet. The Caltrans inspection report required a follow up investigation by the City and the development of a Plan of Action (POA) to address the bridge's scour critical status. Nord Highway has a modest level of traffic with an estimated Average Daily Traffic (ADT) in the range of 500 to 1,000 cars per day.

Investigation:

Quincy Engineering was hired to prepare the POA and the draft report is complete. Their investigation estimated that there is about two feet of embedment remaining for the most exposed pile. Given the erodibility of the stream bed, even relatively low flows in Mud Creek could damage the bridge pile(s) sufficiently for the bridge to fail. This failure could occur quite quickly. However, the risk to life and property is believed to be low. The bridge's most likely failure mode will be for one or more piers in a bent, (a line of piers across the bottom of the bridge), to be swept aside. That would cause a large sag in the bridge deck. It would be unsettling to see, but would probably not result in the bridge deck fully collapsing into the creek. Nevertheless, this is still a major bridge failure and needs to be treated accordingly. As long as the creek is dry or has only minor flows, Quincy Engineering does not see an imminent threat of bridge failure.

Action:

City staff, (both engineering and operations) looked at Mud Creek under the Nord Highway bridge on October 25th and 26th. We have concurred there is substantial flow in the creek. Water is flowing around the exposed piers. Presently, the velocity is slow and swirling action around the piers is minimal. However, with the onset of the rainy season, the time is appropriate for closing the bridge. This closure would stay in effect until the interim measures are built. This may occur as late as the Spring of 2011 depending on construction access at the bottom of Mud Creek.

Specifics:

- (1) Prepare a notification to the City Council and affected City staff.
- (2) Allow for short notification period for the general public.
- (3) Place appropriate warning signage. One set will be at the intersection of The Esplanade and Nord Highway advising drivers that the bridge is closed and that only local traffic should use the road. A second set will be placed at Nord Highway and Meridian Road, the westerly intersection of the affected roadway.
- (4) City staff will coordinate the closure with Butte County as Nord Highway from the bridge to Meridian Road is in their jurisdiction.
- (5) Place barricade(s) best suited for a short term, interim closure as an initial public safety precaution.
- (6) Installation of the barricades and warning signage needs to be done in a timely manner. The next storm is forecast to begin Thursday, October 28th. However, it is not being predicted to be as big as the last one, so relative risk should stay small. High flows from diverted upstream Big Chico Creek flows present the greatest risk and stream flows are well short of that level for some time.
- (7) We have two detour routes
 - (a) Shasta Avenue/Bell Road
 - (b) East Avenue/SR 32The East Avenue/SR 32 route will be chosen. This is better suited to the substantial portion of Nord Highway traffic that is trucks or other heavy agricultural equipment. It also avoids the largely residential neighborhoods along Shasta Avenue/Bell Road. Finally, portions of Bell Road are relatively narrow. Shasta Avenue/Bell Road may become an informal detour regardless, but the official route will be emphasized.

Public Information Plan:

Prepare a press release to advise the public and other affected parties. Print, radio, and television media will be advised. This will be a newsworthy event. We may also wish to send this release directly to neighbors in the immediate area also. The message should be measured, but clear. This will be coordinated with the warning signage placed at Nord Highway.

Follow-up:

Concurrently, engineering staff is already working on an emergency process to expedite environmental review and permitting to construct an interim repair to the bridge as soon as stream flows are low enough to permit construction access. The most likely interim repair will be a low pier wall at the bottom of the bent with the most exposed piles. This would be a low concrete wall covering the exposed piers in a way that it will largely restore their function as if they were still surrounded by soil. Because of active creek bottom erosion though, this is only an interim repair.

During this interim repair effort, or sooner, we can develop the long-term, interim bridge closure facilities that can remotely monitor the status of the bridge and stream flows. These facilities would automatically close the bridge when the bridge is at risk. The remote sensors can be connected to the Municipal Services Center (MSC) by cell phones or similar arrangement. Railroad style crossing gates, (across the entire bridge width at each end), could be automatically triggered if stream flow rises high enough or an unacceptable tilt is registered in the bridge piers supporting the bridge. Maintenance staff could drive out to check when the gates are triggered to confirm that an emergency exists. This would avoid unnecessary bridge closures.

Finally these interim measures when implemented, are designed to give us enough time to develop, design and construct the appropriate stream channel stabilization plan to permanently protect the bridge. This will involve extensive modification to the creek channel. Given previous experiences with permitting agencies, it is anticipated that this could take up to two years. Design can easily be accomplished during this time with construction of the permanent solution to follow.