



National Transportation Safety Board

Washington, D.C. 20594

Urgent Safety Recommendation

Date: October 21, 2004

In reply refer to: H-04-32 and -33

Honorable Mary E. Peters
Administrator
Federal Highway Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

The U.S. Border Patrol (USBP) has conducted continuous immigration checkpoint operations on Interstate 87 (I-87) near North Hudson, New York, about 74 miles south of the Canadian border, since December 29, 2003.¹ Checkpoint operations (referred to by the USBP as tactical deployment mobile stations) require all vehicles in both southbound traffic lanes to stop for a brief driver interview and possible inspection. As a result, traffic sometimes becomes congested on I-87 southbound and backs up north of the checkpoint. Thus far this year, the National Transportation Safety Board has investigated two accidents that occurred at the North Hudson checkpoint.

On February 22, 2004, about 2:40 p.m., traffic was backed up to a point about 900 feet (0.17 mile) prior to the USBP checkpoint. A 1998 Prevost motorcoach, carrying 47 passengers, approached the area of congested traffic at a recorded speed of 64 mph² in the posted 65 mph zone. The bus driver stated that when he first observed the rear of the tractor semitrailer at the end of the traffic queue ahead, he thought he was slowly catching up to it. He said that he momentarily looked in his rearview mirrors and afterwards noted that he was rapidly advancing on the semitrailer. Once he realized the semitrailer was not moving, the bus driver said he made a hard brake application to avoid colliding with the stopped tractor semitrailer but could not slow his vehicle in time to avoid a collision. The motorcoach swerved to the left and, after skidding 123 feet, struck the rear of the semitrailer, pushing it 120 feet into the rear of a 2003 Chevrolet sport utility vehicle, which in turn was pushed into the rear of a 1992 Chevrolet passenger car. Eight motorcoach passengers sustained serious injuries. The driver and 38 passengers sustained minor injuries and 1 passenger was uninjured. The driver of the tractor semitrailer was not injured. Of the seven occupants in the two passenger vehicles, six sustained minor injuries and one was not injured.

¹ When continuous operations began, 40 agents, rotating in three 8-hour shifts, staffed the checkpoint 24 hours per day, 7 days per week. Beginning March 17, 2004, the USBP switched to two 8-hour shifts staffed by 20 agents.

² Investigators calculated vehicle speed based on postcrash data obtained from the motorcoach's Detroit Diesel DDEC IV electronic engine recorder.

On September 19, 2004, about 2:26 p.m., traffic was backed up to a point about 807 feet (0.15 mile) prior to the USBP checkpoint. A 2004 Peterbilt tractor semitrailer approached the area of congestion, failed to stop, and collided with a 1990 Honda passenger car, pushing it underneath a 1999 GMC pickup truck. The tractor semitrailer continued forward, colliding with a 1994 GMC pickup, which was towing a 29-foot Nomad camper trailer, and with a 1994 Peterbilt tractor semitrailer. A fire ensued, destroying the Honda, the 1994 GMC pickup, and the accident vehicle. Two adults and one child in the Honda were fatally injured, as was the driver of the 1994 GMC pickup. The tractor semitrailer driver, the driver of the 1999 GMC pickup, and a passenger in the 1994 GMC pickup sustained serious injuries; the 1994 Peterbilt driver was not injured.

North Hudson Checkpoint

The USBP first began conducting checkpoint operations along I-87 near North Hudson in 1988. These operations, which were in place for 4 or 5 consecutive days, typically occurred no more than five times per year. The checkpoint was located in the rest area beside the interstate. After a USBP agent was seriously injured in 1989, the checkpoint was moved to the main lanes of I-87. On December 29, 2003, in response to an elevated threat of terrorist activities, the USBP instituted a continuous operation in the North Hudson area to provide a checkpoint daily throughout the year.

The North Hudson checkpoint is situated within the southbound lanes of I-87 at the entrance to the High Peaks rest area. At this location, Border Patrol agents stop all traffic on the interstate and conduct preliminary interviews with motorists. If a more thorough examination is warranted, the vehicle in question is directed out of the traffic flow and into the rest area. According to the USBP, on average, each preliminary interview lasts 10 seconds.

Personnel from the Swanton District USBP sector, where the North Hudson checkpoint is located, created initial temporary traffic control (TTC) plans designating the type and placement of traffic control devices to be used prior to and at the checkpoint. Subsequently, the USBP submitted a proposal to the New York State Department of Transportation (NYSDOT) for review to ensure that the signs conformed to the *New York State Manual on Uniform Traffic Control Devices* (NYMUTCD) and to discuss paying for the signage. The NYSDOT made several changes to the wording on the warning signs so that the signs would comply with NYMUTCD guidelines and eliminated the proposed use of nonconforming flashing lights.³ The NYSDOT did not suggest alternative layouts.

³ The nonconforming lighting included post-mounted yellow, red, and blue police-style strobe lights that were to be erected about 3,000 feet north of the checkpoint and a red light that was to be used at the checkpoint stop signs.

In addition to the USBP, the New York State Police (NYSP) uses the High Peaks rest area for commercial vehicle inspection and enforcement activities. The various uses of the facility resulted in a series of signs and flashing beacons being posted along the southbound interstate approaching the rest area (see figure 1). The first sign, “Vehicle Inspection Ahead When Flashing,” was located 4,631 feet (0.88 mile) before the checkpoint. None of the signs gave specific notice about traffic ahead being stopped in the roadway.

Following the February accident, the USBP and NYSDOT added signage along the approach to the rest area (see figure 2):

- Changeable message sign that alternated between “Reduce Speed” and “Stop Ahead” (in median 4,780 feet prior to checkpoint)
- “Traffic Stopped Ahead” (on right side of road and median 3,770 feet prior to checkpoint)
- “Reduce Speed” (on right side of road and median 2,330 feet prior to checkpoint)
- “Be Prepared to Stop” (on right side of road and median 913 feet prior to checkpoint)

The additional signage notified drivers that traffic might be stopped ahead but did not state where traffic might be stopped on the interstate for the checkpoint. The large number of signs—at least 25—may have been confusing to motorists.

Following the September accident, the USBP and the NYSDOT again added signage (see figure 3; signs more than 5,280 feet from the checkpoint are not shown on the diagram):

- Changeable message sign that alternates between “Be Prepared to Stop” and “Stopped Traffic Ahead” (in median 2.6 miles prior to checkpoint)
- “Speed Zone Ahead” (on right side of road and median 2.2 miles prior to checkpoint)
- “Speed Limit 45” (on right side of road and median 2.0 miles, 1.8 miles, and 1.2 miles prior to checkpoint)
- Changeable message sign that alternates between “Speed Limit 45 MPH” and “Your Speed ___ MPH” (in median 1.1 miles prior to checkpoint)
- “Speed Limit 30” (on right side of road and median 3,300 feet and 2,138 feet prior to checkpoint)
- Symbol sign for stop ahead (on right side of road and median 3,036 feet prior to checkpoint)

This additional signage created a speed zone in which drivers are to reduce their speed from 65 mph to 45 mph 2 miles prior to the checkpoint and then to 30 mph 0.6 miles before the checkpoint. The NYSDOT also plans to install rumble strips about 1 mile prior to the checkpoint.

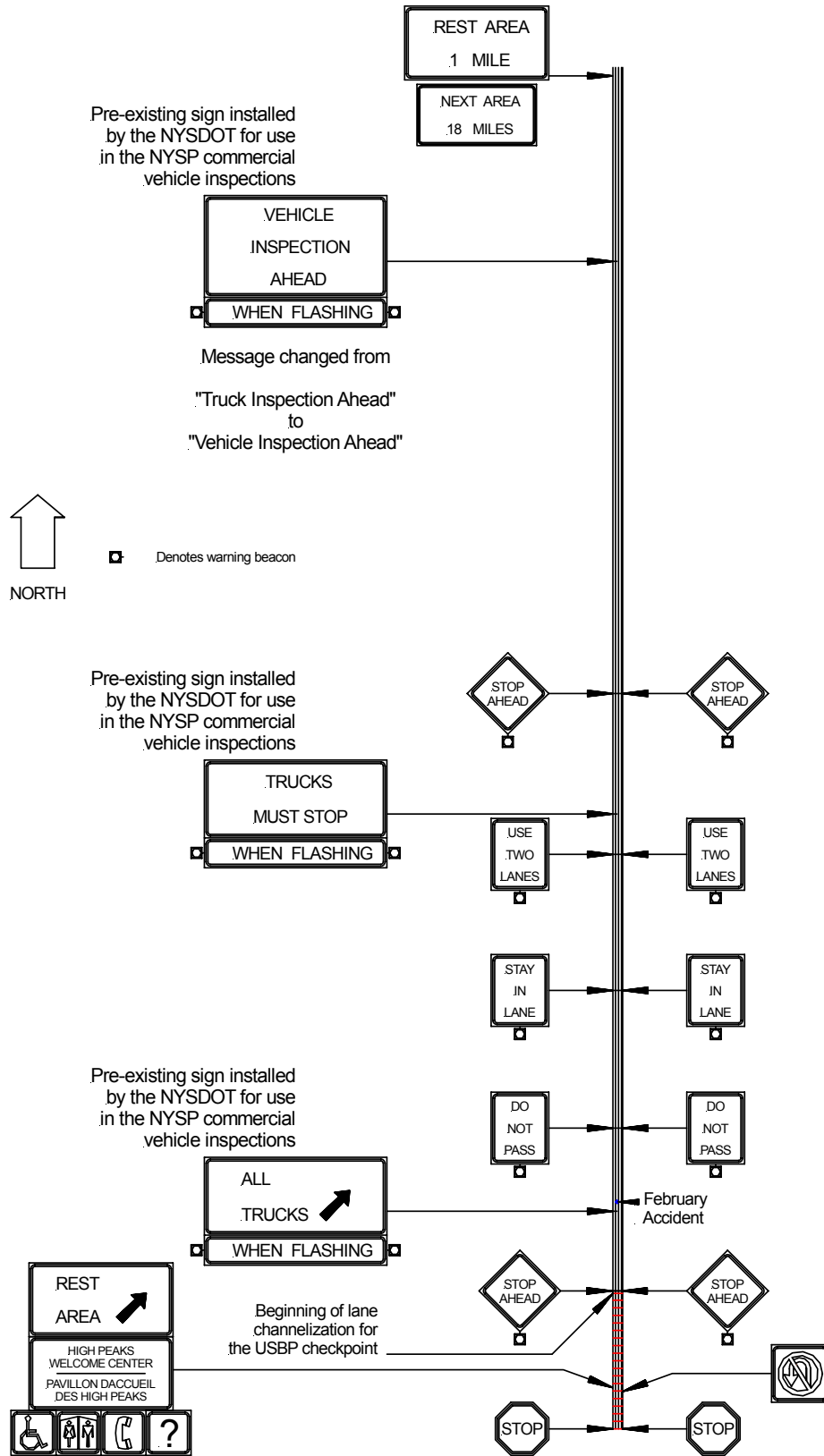


Figure 1. Signage at approach to USBP checkpoint on February 22, 2004.

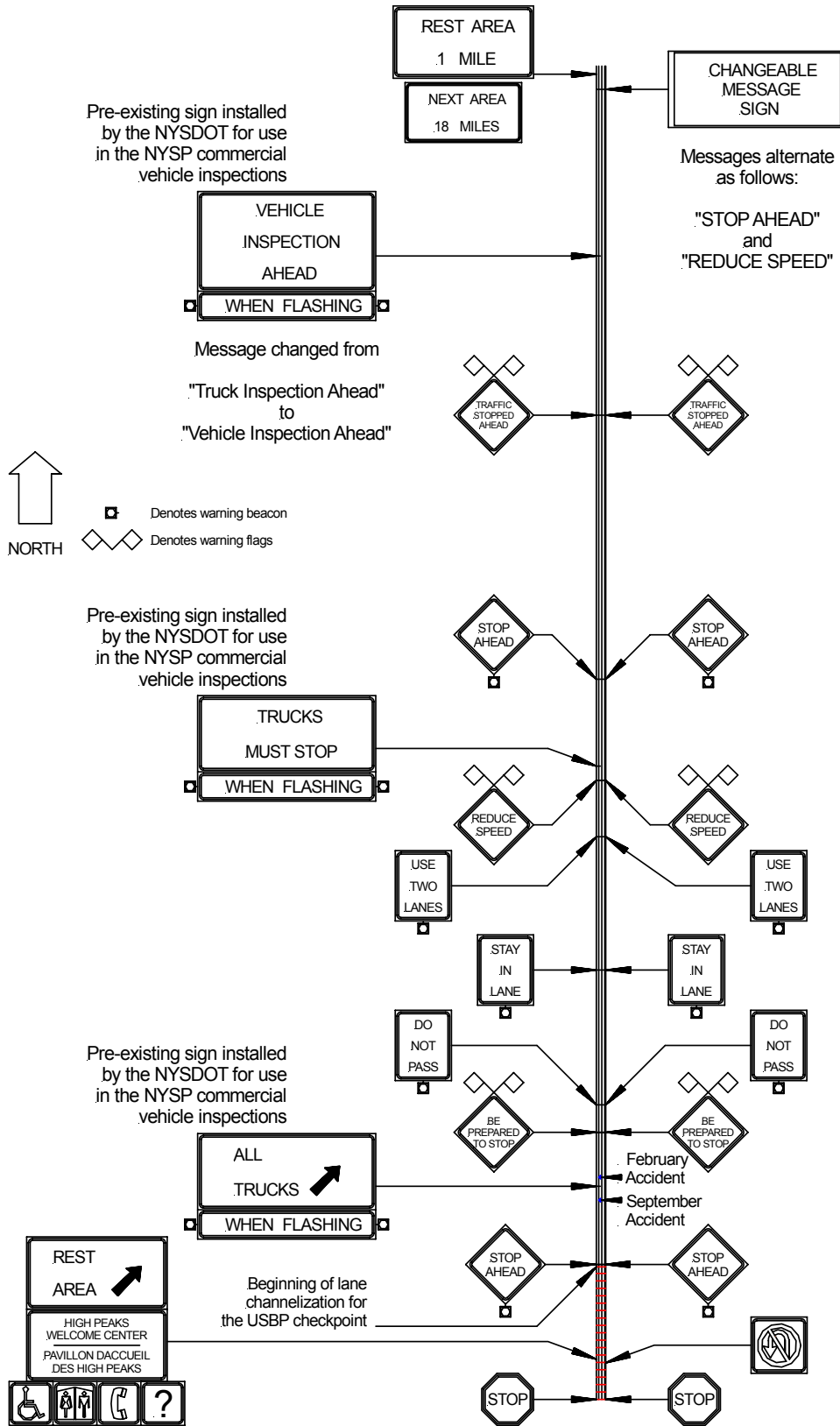


Figure 2. Signage at approach to USBP checkpoint on September 19, 2004.

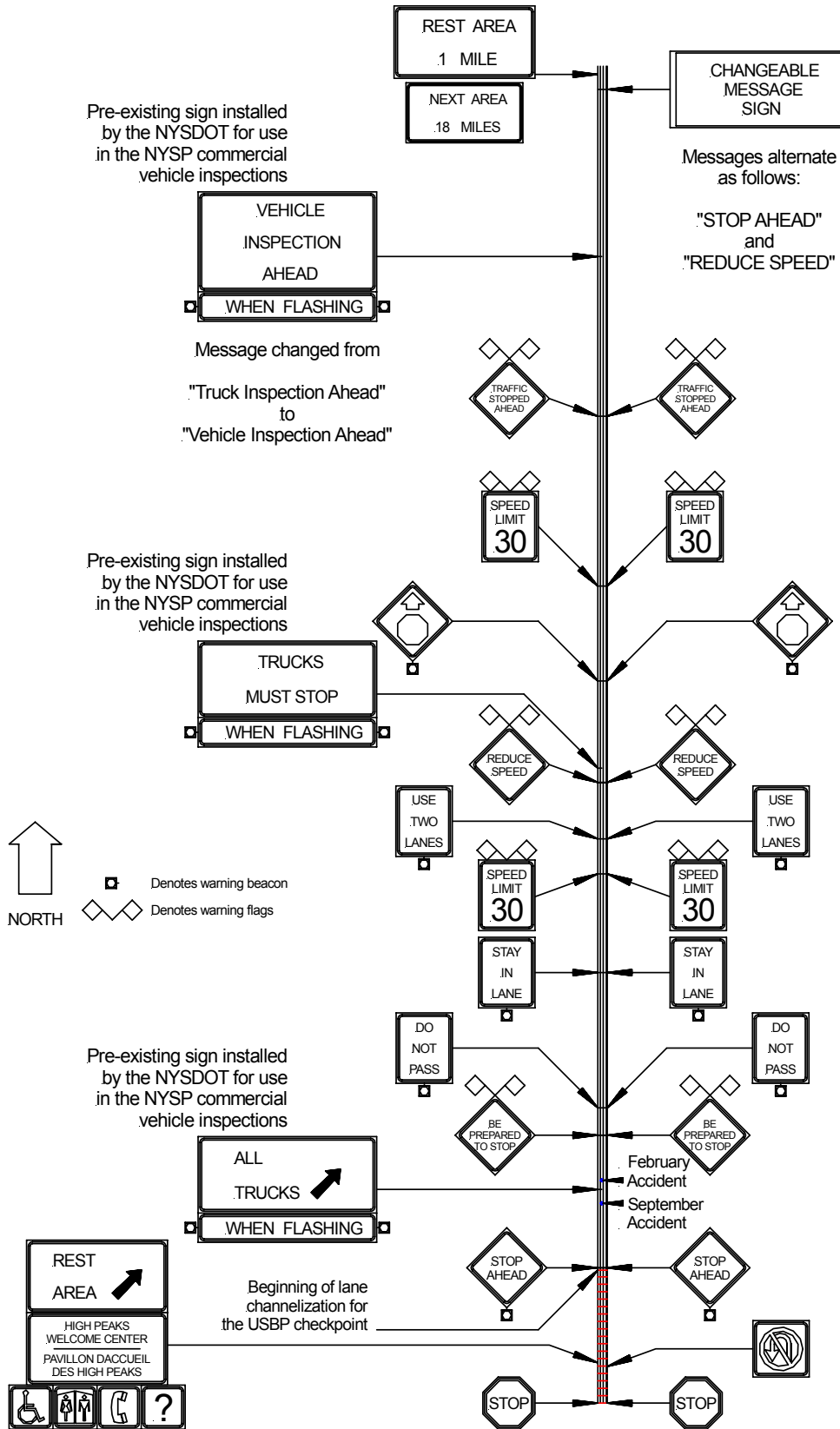


Figure 3. Signage at approach to USBP checkpoint after September 22, 2004.

The *Manual on Uniform Traffic Control Devices* (MUTCD), maintained by the Federal Highway Administration (FHWA), is the national standard for all traffic control devices. Section 1A.02 of the MUTCD lists five requirements for effective traffic control devices; they must fulfill a need, command attention, convey a clear, simple meaning, command respect from road users, and give adequate time for proper response. Evaluated against these criteria, the traffic control devices at the North Hudson checkpoint were not effective. For example, the signage in place prior to the first accident did not clearly convey that traffic would be stopped ahead. One sign indicated “Vehicle Inspection Ahead When Flashing,” but the beacons were not flashing. Another sign indicated “Stop Ahead” and was immediately followed by one stating “Trucks Must Stop When Flashing,” possibly leading drivers of other vehicle types to conclude the stop did not apply to them.

Following the second accident, the number of signs in less than 1 mile preceding the checkpoint increased to 29, resulting in an array of messages that was hardly simple and may have confused motorists. Section 2A.16 of the MUTCD cautions that “overloading road users with too much information is not desirable,” and researchers have found that many safety signs are not noticed in situations of high visual clutter.⁴ Although the USBP and the NYSDOT made a commendable effort to improve traffic control at North Hudson after the two accidents, they acted without the benefit of a systematic, comprehensive approach to traffic control in the area. The Safety Board concludes that the signage in place prior to the USBP checkpoint at North Hudson did not clearly convey adequate information to warn motorists that traffic on the interstate would be stopped ahead; the Board further concludes that the numerous signs added to that area following accidents in 2004 may lead to driver confusion due to information overload.

USBP Checkpoints Nationwide

In addition to fixed inspection stations located along the international boundaries of the United States, the USBP employs checkpoints within the “zone of security,” which extends inward for 100 miles from any external boundary, as a method of interdiction to stem the smuggling of illegal entrants, narcotics, and other contraband. These checkpoints number about 100, many of which, like the one at North Hudson, are located on high-speed arterial roadways⁵ in States bordering Canada and Mexico. Unlike secondary roadways, on which drivers expect to stop for lights, stop signs, and other vehicular traffic, high-speed arterials are designed for free-flowing traffic. When traveling on high-speed arterials, drivers do not expect to have to come to a complete stop; their expectation is that traffic will continue to flow freely.

In a December 30, 2003, internal memorandum, the USBP established a policy for traffic checkpoints based on its experience with such operations.⁶ That policy requires that traffic

⁴ Brendan Wallace, *External-To-Vehicle Driver Distraction*, Scottish Executive Social Research (Edinburgh: Crown, 2003); see also Neil D. Lerner, Robert E. Llaneras, Hugh W. McGee, Sunil Taori, and Gerson Alexander, *Additional Investigations on Driver Information Overload*, National Cooperative Highway Research Project Report 488 (Washington, DC: Transportation Research Board, 2003).

⁵ Arterial roadways connect larger cities and towns and emphasize a high level of mobility for through-traffic movement.

⁶ The USBP does not have a traffic engineer on staff and did not consult with outside engineers.

control be based on guidance set forth in the MUTCD. The policy recommends the use of 4 “Stop Ahead” signs (2 with flashing yellow lights), 1 “Stop” sign with 2 flashing red lights, 2 “Thank You” signs, 1 “Slow” sign, 1 “No Passing” sign, floodlights, at least 15 cones, and 1 vehicle equipped with emergency lights. All recommended measures, except the “Slow” sign and the vehicle equipped with emergency lights, were in place at the North Hudson checkpoint at the time of the first accident; after the first accident, USBP officials added two “Reduce Speed” signs to the checkpoint. At the time of the second accident, a vehicle equipped with emergency lights was in place at the checkpoint.

The USBP memorandum recognizes rumble strips as a possible danger on interstate highways and recommends their use only with permission from State authorities. The policy states that on four-lane divided highways, two “Stop Ahead” signs are to be placed 0.5 mile prior to the checkpoint and two more “Stop Ahead” signs with flashing lights are to be placed 1,020 feet (0.19 mile) before the checkpoint. Beginning about 570 feet (0.11 mile) before the checkpoint, according to this policy, traffic cones should be evenly spaced and the “Stop” sign should be placed in the center of the roadway at the last cone. Checkpoint operations are to be suspended if conditions pose a risk of injury to USBP agents or the traveling public; such conditions include an accident in the vicinity, too much congestion, icy roads, or inclement weather.

Local USBP agents develop site-specific traffic control plans for each checkpoint, and the USBP generally consults with State departments of transportation to ensure compliance with State policies. As a result, the plans vary from location to location. For instance, at two checkpoints (San Clemente and Temecula), California uses overhead signs, and at another (I-8), the travel lanes taper from two to one as traffic traverses the checkpoint. A Texas checkpoint (Sierra Blanca) also tapers from two lanes to one and directs all traffic to a three-lane off-highway checkpoint; due to a fatal accident in 2003, the Texas Department of Transportation plans to install rumble strips 1 mile prior to this checkpoint. At two New Mexico checkpoints in Las Cruces, the highway speed limit is reduced before the lanes taper to an off-highway checkpoint; at the checkpoint on I-10, the FHWA has approved \$4.1 million to widen the one-lane off-ramp to two lanes to separate commercial truck traffic from passenger car traffic. At two California checkpoints, cameras mounted on overhead signs monitor traffic, and the checkpoints are shut down if traffic backs up beyond the signs. When traffic begins to flow freely again, the checkpoints resume operation. In other States, such as Texas and New York, USBP personnel wave vehicles through checkpoints if they detect a traffic backup, though all vehicles must still exit the interstate.

Most TTC information and references in the MUTCD focus on work zones and incident management for accidents or special events. Although this TTC guidance can be adapted for other types of road closures, it strongly emphasizes work zones and incident management, and MUTCD users may not recognize its applicability to other situations, such as checkpoints on high-speed arterials. For example, chapter 6B.01 of the MUTCD states: “The control of road users through a temporary traffic control zone shall be an essential part of highway construction, utility work, maintenance operations, and incident management.” Chapter 6B.01 does not contain any information specific to checkpoint operations on interstates. Nor do any of the “typical applications” described in the MUTCD discuss stoppage of traffic in all lanes of an interstate. Yet the USBP recommends compliance with the MUTCD in designing checkpoint

traffic control plans, and the principles of incident management and related guidance in it are intended to apply to checkpoint operations, where all traffic must come to a stop on or next to a high-speed roadway. The Safety Board concludes that the MUTCD did not provide easily identified, clearly stated guidance on traffic control plans that, in conjunction with site-specific input from State departments of transportation, could have helped prevent accidents such as those that occurred in 2004 at the checkpoint in North Hudson, New York.

Although the causes of both accidents, including the extent to which TTC contributed to them, are still under investigation, the Safety Board has determined that the signage at the USBP's North Hudson checkpoint clearly has the potential to contribute to future accidents. Furthermore, guidance is lacking for those officials tasked with setting up TTC at checkpoints where all traffic must stop on the roadway. Despite the absence of such guidance, the USBP has developed traffic control plans for its checkpoints and has modified those plans in response to accidents. The American Association of State Highway and Transportation Officials (AASHTO), the FHWA, and the State departments of transportation have expertise in developing traffic control plans and are in a position to assist the USBP in developing comprehensive guidelines for such checkpoints. The Safety Board believes that AASHTO should take the lead, with the assistance of the FHWA and the U.S. Bureau of Customs and Border Protection, in immediately developing comprehensive traffic control guidelines specifically tailored to USBP checkpoints located on high-speed arterial roadways and that the USBP should use those guidelines, once developed, as a basis for implementing traffic control at checkpoints nationwide. The Board further believes that the FHWA, in cooperation with AASHTO, should incorporate those guidelines into the MUTCD.

Therefore, the National Transportation Safety Board makes the following safety recommendations to the Federal Highway Administration:

Assist the American Association of State Highway and Transportation Officials and the U.S. Bureau of Customs and Border Protection in immediately developing comprehensive traffic control guidelines specifically tailored to U.S. Border Patrol checkpoints located on high-speed arterial roadways. **(Urgent)** (H-04-32)

Incorporate, in cooperation with the American Association of State Highway and Transportation Officials, the guidelines referred to in Safety Recommendation H-04-32 into the *Manual on Uniform Traffic Control Devices*. (H-04-33)

The Safety Board also issued related safety recommendations to the U.S. Bureau of Customs and Border Protection and the American Association of State Highway and Transportation Officials.

Please refer to Safety Recommendations H-04-32 and -33 in your reply. If you need additional information, you may call (202) 314-6444.

Chairman ENGLEMAN CONNERS, Vice Chairman ROSENKER, and Members CARMODY, HEALING, and HERSMAN concurred in these recommendations.

By: Ellen Engleman Connors
Chairman