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# EWC UPDATE

## Winter 2007 E-Newsletter

*Institute of Transportation Engineers  
Expert Witness Council*

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### FROM THE EDITOR

*Prepared by: Wes Pringle, P.E.*

When I joined the Expert Witness Council I was hoping to learn about how to become an expert witness and the different experiences in practicing this particular brand of traffic engineering. Other engineers who receive this newsletter may be interested in this as well. I hope to receive some articles in these next few months on what it takes to start giving expert testimony and/or what your experiences were doing this for the first time. Were there questions that surprised you? Was the experience worth it?

Of course, we always need articles about any expert witness issue, but I am particularly interested in what it takes to get into the expert witness field.

### PLATFORM-TO-RAILCAR GAP

*Prepared by: Carl M. Berkowitz, Ph.D., P.E., AICP*

This article addresses two critical safety issues that affect passengers using subway and commuter rail platforms:

- Platform-to-railcar horizontal gap
- Platform-to-railcar vertical gap

The National Safety Council ranks falling second only to automobile injuries as the nation's leading cause of accidents. All falls (which begin with a slip or a trip) must be taken seriously because they can result in potentially fatal injuries or permanent disabilities. Therefore, passenger providers must exercise the

highest degree of care in reducing or eliminating the causes of falls associated with their operations.

Rail passenger gap falls occur when an object or the nature of the walking surface prevent or delay the passenger's rear leg from moving forward to achieve a safe footing at the instant the foot makes contact with the surface ahead. Safe walking requires perfect timing in the transfer of support and balance from one leg to the other. The slightest change can result in an imbalance leading to a serious fall as the body continues to move forward.

There are two aspects to the platform gap: 1) the vertical difference between the car floor and platform surface elevation and 2) the horizontal separation of the railcar from the platform. Today's rail transit equipment uses mechanical and automatic car floor leveling systems to maintain the car floor level with the passenger platform. This is an important safety feature because when the railcar floor is above the platform, a tripping hazard is created for passengers boarding the vehicle; when the car floor is below the passenger platform, it is a tripping hazard for passengers exiting the railcar. Most falls are initially precipitated by a trip, and if the gap is wide enough, the extension of the passenger's leg might fall into the space. Most modern transit systems with proper design and construction of platforms, maintenance and car floor leveling devices can attain vertical and horizontal gap clearances that make it unlikely that a passenger will trip on the car doorsill or platform, or that a passenger's foot will pass between the car and the platform.

The U.S. Department of Transportation's "Accessibility Handbook for Transit Facilities" (1992) addresses the various standards for rail platforms, including the relationship to vehicle gaps and access to vehicles from platforms using lifts and ramps. This handbook recommends:

- For the safety and convenience of passengers, ideally the gap between the platform edge and the rail vehicle should be almost nonexistent. Reference is made to 49CFR37: Section 10.3.1 of Appendix A, which sets a standard for new vehicles stopping at new stations of  $\pm 0.625$  inches (in.) for the maximum vertical gap between the vehicle and the platform under normal passenger loading conditions and a maximum allowable horizontal gap of 3 in. This regulation provides an exception for situations in which existing vehicles stop in new stations. In this circumstance, the maximum allowable vertical gap between the vehicle and the platform surface is 1.5 in.
- According to 49CFR37: Section 10.3.1 and Section 4.5.4 of Appendix A, when it is not structurally or operationally feasible to meet the horizontal and vertical gap requirements, several options are available: mini-high platforms (a platform raised or lowered to meet vehicle height), ramps and bridge plates (connected to the station platform to meet vertical and horizontal gap requirements).

Tripping hazards are determined by the clearance of the foot during walking. Foot clearances during walking have been observed to range from 0.375 in. to 1.5 in. (average 0.6 in.). The American National Standards Institute standard for vertical clearances A117.1 (4.5.2), as published in the Federal Register, requires that the height differentials in adjacent surfaces of more than 0.25 in. be beveled and differentials of more than 0.5 in. clearance be ramped. This standard is consistent with observed foot clearances, and it is recognized that height differentials of 0.5 in. or greater are considered tripping hazards.

The Architectural and Transportation Barriers Compliance Board has developed rail transit platform gap requirements for commuter rail systems as part of the Americans with Disabilities Act (ADA). This act has exceptions for existing commuter railroad facilities and equipment, which temporarily exempt New York City from full compliance; however, it should be noted that the ADA standards were developed through an open public hearing process. This process included comments and recommendations by the rail passenger industry, including rail transit. The resulting standards are considered fully representative of the current state of the art and are now the common standards of practice for designing rail transit systems. According to the Federal Register, Rules and Regulations (Vol. 56, No. 173, September 6, 1991, pp. 45521-45524), these standards require a horizontal gap of no greater than 3 in. and a vertical difference within  $\pm 1.5$  in. under normal passenger load conditions.

#### METCALF V. COUNTY OF SAN JOAQUIN

(No. CO47724, Ct. App. Cal., May 23, 2006)

From *Government Engineering*, July-August 2006

A California court affirmed a jury's finding that the County of San Joaquin was not responsible for damages sustained by a driver injured at a dangerous intersection because the county had placed the stop sign in the best possible place.

The fact that the injured plaintiff had argued that the county created the dangerous intersection must imply that the county had acted negligently and wrongfully under the applicable tort laws. The court rejected this idea. Instead, it held that to establish liability of a public entity for injury caused by a dangerous condition of its property, a plaintiff must prove that the public entity acted negligently or wrongfully and created the dangerous condition.

On the evening of October 6, 2001, plaintiff Thomas Metcalf was dropping off his classmate at her home. As Metcalf approached the t-intersection, his passenger told him to stop before the railroad tracks and then make a left turn onto McKinley Avenue, Metcalf brought his car to a complete stop before the two lines near the railroad tracks. As Metcalf attempted to make a left turn onto McKinley Avenue, the car collided with a truck proceeding northbound on McKinley Avenue. The car hit the truck's refrigeration unit fuel tank and one of the truck's axles.

The county controls the intersection. Sukhminder Chahal was the county's senior civil engineer in charge of the traffic division for 20 years. After his retirement in 2002, Chahal became a temporary employee assisting in the traffic division. According to Chahal, in 1941, the railroad gave the county the right to extend Sperry Road about 50 feet across the railroad tracks to connect with McKinley Avenue. The county was responsible for constructing the connector and the stop controls. There were various conditions imposed upon the county by the railroad, the state public utilities commission and the federal railroad safety branch. One of the conditions was that the connector would not exceed a 4-percent grade. The grade as built has a 9-percent slope to the stop legend and 6-percent slope to the stop limit line. The railroad or the public utilities commission inspected the connector and "[s]omebody signed off on it as complying with the order at the time it was built," Chahal explained.

Chahal said that in 1984, the roadway was annexed to the city. The area became urban, the traffic pattern changed, and the city paved the road. The county retained control of the intersection and the signage.

Chahal evaluated the placement of the stop sign after he took over the traffic division. In Chahal's opinion, the existing location was the "best place" for the stop sign because a motorist traveling on Sperry Road toward the intersection could see the sign clearly. If the stop sign was moved to the right, it would be behind a PG&E pole and the motorist could not see the sign as well. If the stop sign was moved to the left, it would obstruct the railroad sign crossbucks and flashing light. If the sign was moved to the west side of the tracks, it would be obstructed by the railroad sign. A stop sign could not be placed on an island in the middle of the road on the west side of the tracks because there was not enough space, and it would be knocked down by trucks that were turning.

According to Chahal, the county has an inspection system in place to check the roadways "in a systematic manner." A county employee drives to all areas in the county, including the city portions, and checks that all signs and legends and markings are there. The county makes a decision to change a preexisting intersection based on a number of factors: problems discovered by county employees; complaints from citizens; and the number and type of traffic accidents. According to Chahal, the county's records did not contain any complaints about the intersection. Moreover, he was unaware of anything about the "volume and type of traffic collisions" in the intersection that required the county to "consider a change in the design of the intersection or the placement of the signs."

Another witness, Arnold Johnson, is a civil engineer who has served as the traffic engineer for the cities of Santa Monica and Oakland. He has taught traffic engineering courses at the University of California at Berkeley and Laney College in Oakland. He was retained by the county as its expert witness on traffic safety issues.

In Johnson's opinion, "because of the railroad crossing and because of the fact that the roadway drops down slightly as you approach McKinley, ...the optimum or the best location for the stop sign [wa]s in advance of the railroad crossing."

In addition to examining the intersection, Johnson reviewed police reports to determine the accident history of the intersection. There was nothing in the accident reports that should have alerted the county of the need to change the location of the stop sign or take other measures to control the possibility of an accident.

A third witness, William Neuman, is a civil engineer and retired professor of engineering from California State University at Sacramento. As part of his work for the plaintiff in the case, Neuman observed motorists' behavior at the intersection. He saw many motorists stop at the stop bar before the railroad tracks, as they were supposed to, but fail to stop again as they approached the intersection. The 6- and 9-percent grades prevented motorists in cars from seeing the stop limit line and the stop legend. Drivers of "cab-over truck[s]" and some minivans could see these markings.

According to Neuman's calculation, the stop sign is 89 feet from McKinley Avenue. The federal manual on traffic control devices mandates that a stop sign "shall" be located no more than 50 feet from the required

stop. "Shall means you're really supposed to do that...If it's impossible, you have to be smart and for good reasons do something different." He testified it was possible to move the stop sign closer to McKinley Avenue by creating an island in the road and positioning the stop sign on the island. He did not think a truck would "take out...[the] island stop sign if it was making [a] turn."

In Neuman's opinion, the intersection constituted a dangerous condition because "people [we]re stopping in the wrong place."

In his lawsuit against the county, Metcalf alleged the county owned and controlled the intersection; the intersection constituted a dangerous condition in the way it was "designed, constructed and maintained;" the dangerous condition created a substantial risk of injury to people using the roadway; the county knew or should have known the dangerous condition existed; the county "negligently failed to take reasonable precautions to prevent injuries;" and, as a result of the dangerous condition, he suffered "injuries and damages."

A jury found that although the intersection was a dangerous condition, the county had not been negligent or wrongful under the law. Metcalf appealed the jury's finding, stating it was inconsistent. Metcalf argued that the county cannot "escape liability" based on the jury's findings that the dangerous condition was not created by the negligent or wrongful conduct of the county's employee. The county did have notice of the dangerous condition, he argued, because county employees created the intersection and related signage.

In rejecting his argument, the appellate court found that the jury had substantial evidence to rule as it did, in favor of the county, foremost, the testimony of Chahal and Johnson that the stop sign was in the "best place."

It was undisputed that the county created the intersection and related signage, but that in and of itself does not render the county negligent or liable. Nor does it mean that the county had notice of a dangerous condition.

In this case, there was evidence that the intersection and related signage were not dangerous when completed but, rather, became dangerous later in time. The traffic pattern had changed. Even through the county created the intersection, it needed notice of the property's dangerous condition, said the court.

Chahal testified that the county has an inspection system to check on the roadways and there were no complaints about the intersection. Johnson similarly testified there was nothing in the accident history of the intersection that should have alerted the county of the need for change.

The court therefore affirmed the jury lower court's decision in favor of the county.

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Submit all entries to Wes Pringle, [m\\_noelani@yahoo.com](mailto:m_noelani@yahoo.com).

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