

**TZB-147E**

Dear Mr. Anderson,

Thank you for the opportunity to submit comments on the scope of the Environmental Impact Statement to be conducted as part of the consideration of a design or designs for the replacement or rehabilitation of the Tappan Zee Bridge. I am writing in response to your invitation, to comment upon geologic hazards in this region and how they may need to be managed.

The Scoping Update Packet of February 2008 makes mention of seismic issues, but only very briefly. (On pages 17, 41, and 45, there are short references to current seismic criteria, seismic engineering standards, and seismic vulnerability.)

There is no mention of the expectation that sea-level will change significantly over the next century. Concerning sea-level changes, a statement is needed on the expected lifetime of a new bridge or tunnel, and how it may need to address changes in sea-level on the order of one meter per century.

In view of the likely costs of addressing seismic hazards, and the need to carry public sentiment along in support of final decisions that may be expensive if they are to address this issue, I recommend that any Environmental Impact Statement for a Tappan Zee Bridge design that evaluates particular designs should

- (a) specify what the seismic hazards are thought to be, in light of modern studies,
- (b) specifies how these hazards will be resisted, and
- (c) compares the merits of different designs, including a tunnel or system of tunnels, from the point of view of how well the designs resist seismic ground motions.

It may be convenient to break the local environmental issue concerning seismic hazard here into three separate questions:

- (1) What is the current best understanding of earthquake hazard (expressed in terms of the probability of exceeding certain levels of acceleration and duration over a fixed period of time, say 50 years), in the Tappan Zee region?
- (2) What level of ground shaking (expressed in terms of acceleration and duration) should a new or rehabilitated bridge/tunnel, built with both state and federal funds, be required to withstand?
- (3) Can such a bridge --- or tunnel --- meet that requirement throughout the projected time for which the bridge is expected to be useful?

This Tappan Zee region is of course subject to earthquakes. Some in the 1800s caused damage over a wide area.

At the meeting convened on February 22 at Rockland Community College by Rockland Legislature Chairwoman Harriet Cornell, we learned that a process of decision-making will be employed in planning a new/restored TZ Bridge, in which items, once decided, cannot be brought up again for review. It is in precisely this context that there could be difficulties with the assessment of seismic hazard, since the academic and engineering communities continue to make discoveries and to reach new levels of understanding. It will undermine

public confidence on the decision-making process if the group developing options is not well-informed on assessments of seismic hazard in the TZ region.

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Concerning changes in sea level, it is my impression that there has been zero planning. But for a bridge or tunnel that could be in services for many decades, designers do need to consider such changes and to state how they will be accommodated.

With all best wishes, I am yours sincerely

Paul G. Richards

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