

**Follow up by John Niles to the Sound Transit Board
on Link Light Rail Safety Certification
March 27, 2003**

Good afternoon, I'm John Niles, 4005 20th Avenue West in Seattle. I am the technical coordinator for the Coalition for Effective Transportation Alternatives, CETA, an association of citizens advocating better transit than what Sound Transit is planning to implement in the Central Link Initial Segment.

I understand that the Board is going to hear a presentation on light rail safety during this meeting. That's a good thing. I look forward to it.

As I reported to you one month ago at the February 27 Board meeting, I believe that Sound Transit and Federal Transit Administration have a serious problem in the safety certification of the **design** of the Central Link Light Rail Initial Segment. I am focused on the particular hazard of intermodal collisions – the risk of trains hitting road vehicles and pedestrians – and how predictable hazards of the existing design will be resolved to an acceptable quantitative index level under professional guidelines. Intermodal collisions are a major cause of fatalities from existing light rail systems nationwide.

The first priority for resolving hazards, as stated in Section 4 of the Sound Transit Safety and Security Management Plan, is to **design for minimum risk**. A design that includes intersections of train tracks and motor vehicle roads, and that allows pedestrians to cross tracks, is intrinsically hazardous. The principle of designing for safety was recognized in an earlier decision by Sound Transit not to mix buses and trains in the Bus Tunnel, a judgment reversed in the Board, King County, City of Seattle, and FTA decision to implement joint bus-rail operations in the DSTT. This decision is now being audited by the Office of Inspector General at the request of Congress.

The principle of designing for safety was also implicit in the earlier configuration of regional rapid rail, the system recommended by professional analysts in the 1993 Project Level EIS from the JRPC that preceded RTA. Grade separation initially recommended in the RTA rapid rail concept has evolved over the course of a decade into the Central Link Initial Segment with its more hazardous design features.

My reading of the evidence made available to date (provided recently through PDA requests) is that some of the points of intermodal intersection designed into the Central Link Initial Segment in the Bus Tunnel and through the Rainier Valley should be rated at hazard index 1C, meaning “occasionally catastrophic,” and meaning “likely to occur sometime in the life” of each place where a grade crossing or shared guideway exists. These phrases are taken directly from the professional hazard analysis guidelines issued by the Federal Transit Administration and inserted verbatim into the Sound Transit Safety and Security Management Plan. Hazard index 1C represents an “unacceptable” condition under Federal and professional guidelines. My claim is that governments must not build new public mass transit with features rated at hazard index 1C.

To be clear, I am challenging the points where Sound Transit's safety processes have not rated such design features as hazard index 1C, but rather as 1D (meaning catastrophic but

unlikely) or as 2C (meaning critical but not causing fatalities). I want the public to understand how Sound Transit decided that the 1C hazard level is not warranted, or in some cases how index 1C is planned to be mitigated away without changing the fundamental right-of-way design having opportunities for intermodal collisions.

To assist you in your review of the safety issues that arise from the likelihood of occasional fatal collisions, I have prepared and hand over to you today a list of questions that I recommend you on the Board ask the staff. The answers and discussion may help you to form your own conclusion about the safety of the Light Rail design. I'm also going to encourage the membership of CETA and the news media to ask these questions of you on the Board.

In conclusion, I trust that you on the Sound Transit Board would not deliberately inflict what you understand to be a dangerous light rail system design on the citizens of this region, including the citizens who must cross the tracks at grade or who ride on the buses in a tunnel shared with trains.

So I therefore urge that you direct that the Safety Certification process be carried out in full view of the public to determine objectively and to demonstrate clearly that the light rail design about to be funded and implemented is safe to Federal and professional standards.

Questions or comments to John Niles at 206-781-4475, or jniles@alum.mit.edu

Questions For the Sound Transit Board of Directors to Ask ST Staff About Central Link Light Rail Safety Certification

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Introduction

1. Over the past three reporting years, light rail in America has caused five to ten times more fatalities per vehicle mile than buses.¹ What percentage of light rail fatalities results from trains colliding with cars and pedestrians, thus killing people who are not train passengers?

Rainier Valley At-Grade Crossings

2. Over the course of an average weekday in the next decade, Sound Transit is planning to operate 272 trains on the Central Link Initial Segment.² What is the Sound Transit forecast for the number of motor vehicles that will daily cross the light rail tracks at the 18 grade-level light rail crossings in the Rainier Valley?
3. Federal Transit Administration fixed-guideway hazard analysis guidelines³ require that the expected average time between fatal collision events must be shown to exceed one million operating hours in order for the hazard risk to avoid being “unacceptable.”⁴ Do Sound Transit, FTA, and the Project Management Oversight contractor all agree that the 18 at-grade road crossings Rainier Valley segment can be certified to meet this standard of safety?
4. The last three reported years of light rail operating experience in America (1998-2000) show an overall range of at least three to five fatalities per one million operating hours,⁵ thus as a group not meeting the million hour standard for the mean time between catastrophic events.⁶ Also, the 1999 EIS indicates that Central Link in the Rainier Valley can expect a collision with a person or vehicle ever 12 days.⁷ How does Sound Transit plan to convince FTA and the public that Central Link grade crossings can be expected to go at least one million hours⁸ between fatal collisions?
5. The 1999 EIS indicates that while light rail collisions with motor vehicles in a year could be expected to number 29, the number of vehicle-to-vehicle collisions would fall by 44. Considering the consequences of these two collision types, what are the

¹ *Transit Safety & Security Statistics & Analysis 2000 Annual Report*, posted at <http://www.transit-safety.volpe.dot.gov/publications/safety/>

² Appendix C of the *Central Link Initial Segment Environmental Assessment*, January 30, 2002.

³ *Hazard Analysis Guidelines for Transit Projects*, FTA Office of Safety and Security, January 2000.

⁴ So as not to be rated as a category 1C hazard, meaning “catastrophic, occasional, unacceptable.”

⁵ CETA estimation from data on fatalities per vehicle mile, from source in note 1.

⁶ The group result masks that some systems may in fact meet the million hour standard.

⁷ Table 5.6-10, Transportation Technical Report, *Central Link Final EIS*, October 27, 1999

⁸ About 20 years of operation of the Initial Segment with the planned schedule of train movements.

policy arguments for accepting this tradeoff? Describe how such a tradeoff is to be considered under the FTA hazard analysis guidelines?

6. What did the hazard analysis for the Initial Segment light rail design in the Rainier Valley show as the initial value of the mean time between fatal collision events at the 18 at-grade vehicle crossings along the right of way? What is the stated residual value after controlling measures are applied?
7. The *Washington State DOT Design Manual* section 930 guidelines for railroad crossing protection states that a combination of high daily train volumes and high daily vehicle counts calls for grade separation at crossings.⁹ Why or why not are these guidelines pertinent for Sound Transit and City of Seattle in their design of the intersections between light rail tracks and vehicle roadways?
8. The three at-grade road crossing of light rail tracks along the E-3 busway are reportedly going to be gated, while the 18 vehicle crossings in the Rainier Valley are not planned to be gated. What are the reasons for the difference in treatment? What are the pros and cons of installing gates on one or more of the Rainier Valley crossings?

Downtown Seattle Transit Tunnel (DSTT) Joint Operations

9. In the DSTT under joint operations, 20 trains and 120 buses will share the tunnel right of way during peak hours in both directions.¹⁰ In the hazard analysis for the DSTT, what is the expected mean time between the event of a collision between a bus and a train, where consequences of the event are not specified?
10. For purposes of hazard analysis, what is the calculated probability that a collision event between a bus and a train will cause one or more fatalities?
11. The Critical/Catastrophic Items List for the hazard analysis of the DSTT dated 10/14/02¹¹ does not list bus-to-train collisions as an occasional or remote cause of fatal accidents. Why not?

General

12. Reducing the speed of trains is an available future option for reducing the probability of intermodal collisions along the Central Link right of way. Is reducing train speeds under consideration as a future measure for controlling the risk of fatalities in the DSTT and in the Rainier Valley?
13. The Director's message in the policy section of the Sound Transit Safety and Security Management Plan¹² states that ST will maintain or improve upon the public transit industry standard for safety. What do you consider to be the industry standard for the incidence of intermodal collisions involving light rail trains?

⁹ A daily exposure index of 50,000 (daily vehicle count multiplied by daily trains) indicates the advisability of grade separation.

¹⁰ *Central Link Initial Segment Environmental Assessment*, January 30, 2002.

¹¹ C/CIL No. 4022-16 prepared by Ron Harvey, 02/20/02, obtained by CETA through PDA request.

¹² Section 1: Policy, Purpose, Scope, Goals and Objectives