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**GRADE CROSSING PROTECTIVE FUND  
2009 – 2011 GRANT APPLICATION  
OPEN CALL FOR PROJECTS**

The Washington Utilities and Transportation Commission (commission), through its Grade Crossing Protective Fund (GCPF), provides grants for projects that eliminate or mitigate public safety hazards at railroad crossings and along railroad rights-of-way in Washington State. Any public, private or non-profit entity may submit an application to the commission for a GCPF grant.

**To apply for a grant to eliminate or mitigate a public safety hazard at a railroad crossing or along a railroad right-of-way, complete the following information and submit it and attachments to the commission.**

**Applicant Information**

Applicant Name: Scott Davis

Organization: Thurston County Public Works

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**Project Information**

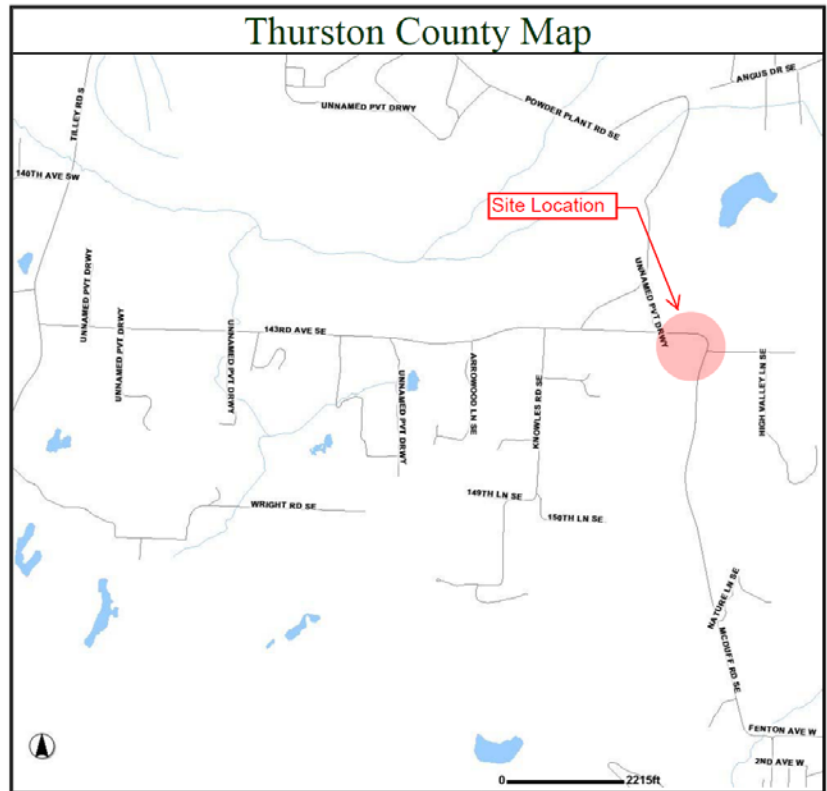
1. Summary of Hazard

The area being investigated is on 143<sup>rd</sup> Ave SE that is a two lane rural county road (see vicinity map below). The railroad crossing sits at the bottom of a vertical curve and beginning of a horizontal curve. Furthermore there is an intersection just south of the crossing and vegetation and an earth berm affect sight distance around the horizontal curve. BNSF has expressed concern regarding this crossing and the sight distance for westbound traffic. They mentioned at an on-site meeting that the gates had been hit before which is the reason BNSF placed ecology blocks in front of each gate. These incidents appear to be un-reported crashes and have caused damage to the gates. These

incidents can be considered “roadway departure crashes”. There have been two reported crashes in the last three years ending in 2008<sup>1</sup> and one accident involved a vehicle that lost control in the curve going westbound

Ironically, the only reported crashed involving the crossing while activated was two vehicles heading eastbound where good visibility exists.

The 3 year crash rate for this curve and crossing is 1.5. This rate is 25% less than the county average for similar roads.



Eastbound 143<sup>rd</sup> Ave SE



Westbound 143<sup>rd</sup> Ave SE

## 2. Proposed hazard mitigation

<sup>1</sup> 2009 Crash information is not used since the final tabulations are still underway consequently our current dataset for 2009 may not (at this time) be a complete representation of the year.

We have reviewed the speed limit and advisory placards on the curve signs and they appear to remain appropriate. Although the reported crash rate is relatively low the following are reasons to consider improvements at this location are:

- BNSF has indicated they have concerns at this location and indicated vehicle impacts to the gate system (appears to be unreported crashes)
- Speed differential from the un-posted speed limit (50) to advisory curve speed (20) is 30 mph
- The crossing location is located at the bottom of a vertical curve and beginning of a horizontal curve.
- The existing mountable median barrier although still functioning appears to be near the end of its useful life.

The concerns at this location are three-fold one is driver awareness of the crossing (especially for westbound traffic), roadway departures and the continued deterioration of the median barrier. They are interrelated at this location need to be addressed enhance and maintain the safety of this crossing. We evaluated several different types of improvements and those include flashing beacon on advanced warning sign, traverse rumble bars, shoulder widening, enhanced signing and sight distance enhancement along the horizontal curve. A summary of the possible safety benefit of each is below:

CFR Source	Description	Crash Reduction Factor	Approximate Cost
Roadway Departure			
FHWA SA-07-015	Shoulder Widening <sup>2</sup>	29%	\$22,100.00
FHWA SA-07-015	Enhanced Signing (chevrons)	35%	\$800.00
FHWA SA-07-015	Traverse Rumble Strips	6%	\$2,000.00
FHWA SA-07-015	Sight Distance Improvements	5%	\$ 46,674.40
Railroad Crossing Awareness			
Kentucky Transportation Center – KTC-96-13	Flashing Beacon <sup>3</sup> (1 approach)	25%	\$39,950.00
FHWA SA-07-015	Traverse Rumble Strips <sup>4</sup>	28%	\$2,000.00
Kentucky Transportation Center – KTC-96-13	Sight Distance Improvements	30%	\$ 46,674.40
Crossing Violations			
North Carolina Department of Transportation Sealed Corridor Phase 1 - US DOT Assessment Report	Mountable Traffic Median	77%	\$15,000.00

<sup>2</sup> This improvement should also reduce frequency the median gets damaged by vehicles resulting in less frequent maintenance and longer lasting system.

<sup>3</sup> Assumed it was an approach to an intersection since there appears not to be crash reduction factors for this type of treatment at a railroad crossing. But since it is similar to an intersection when the gates are activated this may be the most appropriate value to use for this analysis.

<sup>4</sup> Assumed it was an approach to an intersection since there appears not to be crash reduction factors for this type of treatment at a railroad crossing. But since it is similar to an intersection when the gates are activated this may be the most appropriate value to use for this analysis.

Although it was suggested that an actuated beacon be added to the railroad advanced warning sign, we typically reserve those treatments for higher crash locations where other actions do not appear to work. In addition an actuated beacon would appear to only provide a 25% reduction in crashes related to an activated crossing gate. In addition there only appears to be 1 reported crash related to an activated gate not only in the last 3 years but also the last 7 years too. The one reported crash also was not from the direction where there is restricted sight distance. This may suggest an actuated beacon (if used) should be provided for both travel directions to heightened crossing awareness. This of course would increase the cost further. The beacon also does not directly deal with the roadway departures on the curve that apparently (although unreported) have resulted in impacts to the gate system. So the cost/benefit of this improvement is not really high compared to others that we looked at.

We also looked at the improving the sight distance on the curve. This would involve obtaining permission to clear/grade private property. Unlike the beacon this improvement would benefit both crossing awareness and roadway departure but as with the beacon it does not have cost/benefit ratio that compares with the other evaluated improvements.

We evaluated providing paved shoulders for a couple reasons. Shoulder widening is a proven measure to reduce roadway departure crashes and also will help reduce long-term maintenance of the median barrier. Currently the roadway is narrow and vehicles do not have much room to shy away from the median as such this median is damaged by vehicles more than others we have in Thurston County. The widened shoulder will provide additional room for vehicles to shy away from the median and we hope will reduce damage and reduce the frequency of the delineator post replacement.

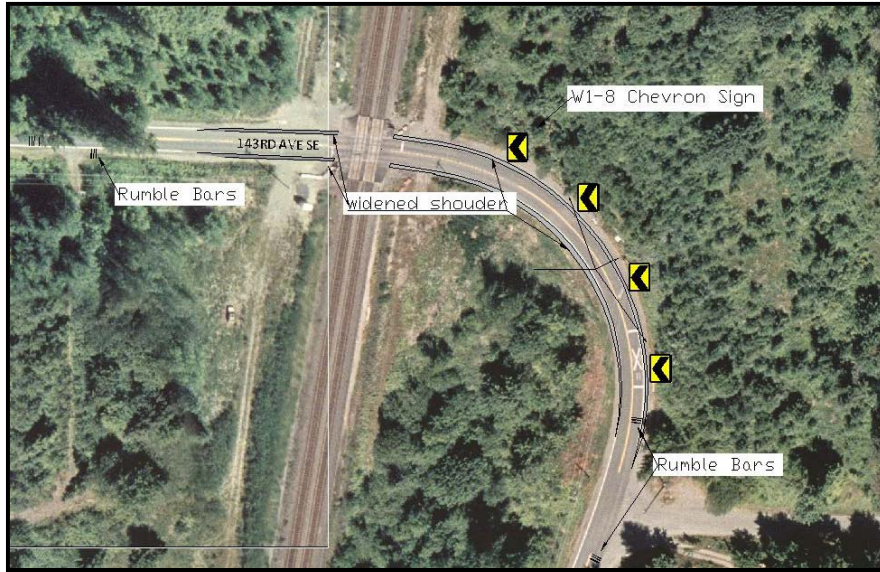
As such the following is our suggested mitigation for this location that address roadway departure, crossing awareness and crossing violations. The mitigation proposed below we believe are the most cost effective approach at this time.

- Providing paved shoulders through crossing<sup>5</sup>
- Replacing the mountable median barrier (100' each side of crossing)
- Adding delineation to the curve (i.e., chevron signs)
- Adding rumble bars at the approach to the curve and railroad crossing signs

*See next page for proposed layout*

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<sup>5</sup> In today's difficult economic environment revenue projections may be less than anticipated and thus affecting our departments work program. Although currently we are scheduled to pave the shoulders this summer unforeseen budget constraints could delay or postpone these improvements.



Sample Project Layout<sup>6</sup>

### 3. Other Involved Organizations

BNSF will need to be contacted prior to any work near the railroad crossing

### 4. Cost Estimate

Thurston County is asking the UTC to fund a portion of the work. This includes design efforts, mountable median barrier, signing and rumble bars. The costs associated with the shoulder paving will be assumed by Thurston County. The following is a cost breakdown by phase and funding source:

ESTIMATED PROJECT COSTS			
PHASE	UTC GRANT	THURSTON COUNTY	TOTAL
DESIGN	\$2,000	\$0	\$2,000
CONSTRUCTION	\$17,800	\$22,100	\$39,900
TOTAL	\$19,800	\$22,100	\$41,900

<sup>6</sup> Note median replacement is not shown

5. Long Term Maintenance

The Thurston County Public Works Department would be responsible for the long term maintenance of the proposed project.

6. Estimated timeline of project

Provided the grant is awarded by May 2010 the following schedule should hold depending on weather and delivery of materials.

PROPOSED SCHEDULE	
DESIGN	September 2010
SHOULDER WIDENING	October 2010
MEDIAN, SIGNS, RUMBLE BARS	Nov.-Dec. 2010

7. Measurement of Success

The success of the project would be measured as a reduction in the reported crash rate of this section of road near the Burlington Railroad crossing.

8. Other information

None at this time.

**Railroad Commitment**

Railroad commitment is attached. See next page.

### Railroad Commitment

The undersigned represents the Railroad Company in the accompanying GCPF application.

We have reviewed the application and are satisfied the conditions are the same as described by the applicant in this matter. We agree to allow construction, modification or demolition on a railroad right-of-way as described in the application. \*

Todd M. Kuhn

Printed name of Railroad Representative



Signature of Railroad Representative

Manager Public Projects

Title

206-625-6146

Phone

todd.kuhn@bnsf.com

E-mail

Date: 3/29/10

\* A BNSF roadway resurfacing permit will be required to perform this work on BNSF's right-of-way.