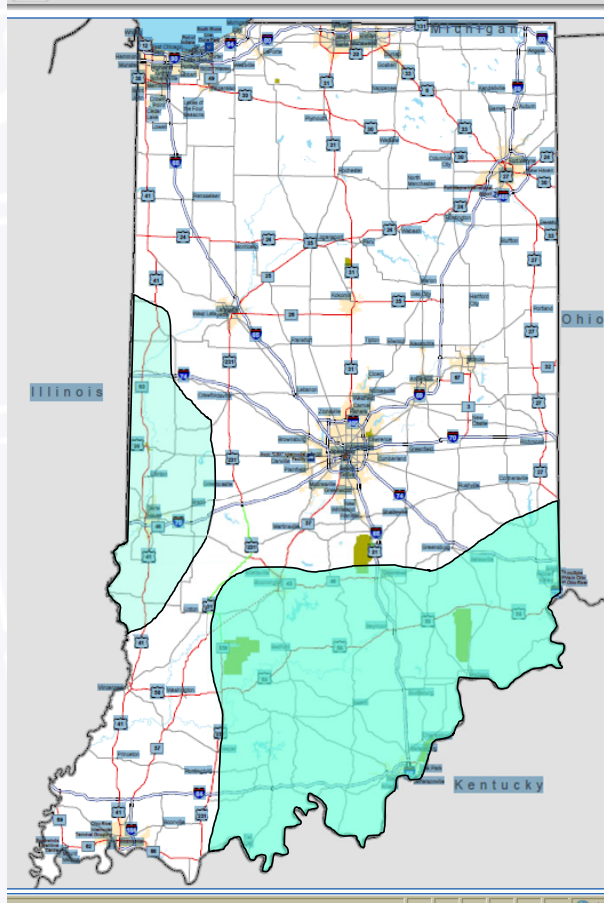


Geotechnical Conference 2021 Landslide Prioritizing and Selecting

February 24, 2021

Joey Franzino

Indiana Road Map



Process of Selecting Slides

- Slides are selected five years ahead of the proposed letting
 - This District needs time to program the projects with a Des Number
 - The District needs to get a Design Consultant on board
 - We need to do a Geotechnical Investigation
 - We can do it in-house
 - We can select a Geotechnical Consultant who is suitable for the specific type of Landslide
 - We generally provide multiple repair options
 - A meeting is held with the District to include the Project Manager, Construction and Technical Services
 - As a group, we select a repair option
 - We might have to provide more specific recommendations for that option
 - The Design Consultant needs time to prepare plans for our selected repair option
 - Slides require substantial time for the following
 - Right of Way
 - Permits
- Then the Project is Ready for Letting

Process of Selecting Slides

- We begin with three days of visiting slides in Seymour and Vincennes Districts
 - During those field checks, we rate each of the slides
 - We select the slides we want for the letting five years ahead
 - Typically, a slide receiving over 300 points gets selected
 - A slide receiving between 250 and 300 points becomes a judgment call
 - A slide receiving less than 250 points typically would not get selected
 - Season of Field Check
 - In the past, we conducted our three days in the field in Autumn
 - We are planning to move these to April
 - Gives the District much more time to prepare Des Numbers which are typically due at the end of the year
 - Early April is the best time to view slides, no leaves on trees and no snow
- For Other Districts, we typically take slides individually through the year
- We might give one day to visiting slides in Crawfordsville District in the future

Emergencies

- Some Slides become emergencies after we program them
 - In most cases, we keep the slide programmed
 - We repair the portion of the slide that is an emergency as quickly as possible
 - We have temporary repairs and permanent repairs
 - If a temporary repair is constructed, the slide will remain in the future letting it is programmed for
 - If a permanent repair is constructed for a portion of the slide, we might keep the remainder programmed, depending on how we would rate the remainder
 - If the permanent repair is constructed for the entire slide, we remove it from the repair program



Prioritization

Guidelines for Rating the Necessity to Repair Landslides

Slide Information and Location: _____

(Road, County, and RP needed) _____

Table 1: Importance of Road

Rating Topic	How To Rate	Count	Modifier	Total
Vehicle Traffic	1 point per 1000 vehicles per day		/1000	
Detour	1 point per two minutes lost in nearest state available detour		/2	
Road Specifics	25 points for major point of public interest			

Total Points for this table: _____

Table 2: Maintenance History

Rating Topic	How to Rate	Count	Modifier	Total
Total Visits by INDOT Maintenance	5 points per visit in past year (may have to estimate)		*5	
Type of Maintenance	10 points for slope plus 20 points for pavement			
Length of Maintenance	1 point per five feet of pavement plus slope maintenance		/5	

Total Points for this table: _____

Table 3: Slope

Rating Topic	How to Rate	Count	Modifier	Total
Length from Tipline to Tipline	1 point per 20 feet of length		/20	
Distance from Pavement	30 points if affecting, 25 points if adjacent, 20 points if within 10 feet, 10 points if within 20 feet, otherwise zero points			
Distance from other Structures				
Length from Scarp to Toe Bulge	1 point per 5 feet of length		/5	
Vertical Displacement of Scarp	3 points per inch	These two items should receive zero points if the slide affects the pavement.	*3	
Horizontal Displacement of Scarp	5 points per inch		*5	
If the scarp and toe bulge are on opposite sides of the road beyond the pavement, add 20 points				

Total Points for this table: _____

Table 4: Pavement

Rating Topic	How to Rate	Count	Modifier	Total
Length of Pavement affected	1 point per 5 feet of length		/5	
Width of Pavement affected	1 point per foot of width			
Vertical Displacement of Pavement	10 points per inch (may have to estimate)		*10	
Horizontal Displacement of Pavement	20 points per inch (may have to estimate)		*20	

Total Points for this table: _____

Table 5: Site Conditions

Rating Topic	How to Rate	Count	Modifier	Total
Slope Rate	3.5:1 - 0 points, 3:1 - 3 points, 2.5:1 - 10 points, 2:1 - 20 points, 1.5:1 - 30 points, 1:1 - 45 points, Steeper than 1:1 - 75 points			
Slope height	1 point per 2 feet of height		/2	

Total Points for this table: _____

Table 6: Potential Future of the Slide if not corrected (estimate for next ten years)

Rating Topic	How to Rate	Total
Road Closure Possibility	None = 0 points, Low = 20 points, Medium = 100 points, High = 300 points	
Potential Cost Increase	None = 0 points, Low = 10 points, Medium = 100 points, High = 200 points	
Current Hazard	None = 0 points, Low = 20 points, Medium = 100 points, High = 300 points	

Total Points for this table: _____

Table 7: Other Intangible Issues Related to the Slide

This table can be used if the person inspecting the slide feels like there are reasons other than what is listed in the above six tables, for adding points to this slide. In general, the amount of points added should be less than 20 if the issue is of minor concern, 20 points if the issue is of medium concern, and more than 20 points if the issue is of serious concern.

Rating Topic	Total Points

Total Points for this table: _____

Use the following space to provide justification for any high ratings on Table 6 or more details about any issues listed in Table 7 (use back of page if needed):

Total points from Page 1: _____

Total Points from page 2: _____

Grand Total Points for this Slide:

Prioritization – Photos of SR 63



Prioritization – Rating Sheet for SR 63

Joey Franzin

Guidelines for Rating the Necessity to Repair Landslides

Slide Information and Location: SR 63 at Route Post 36+63 Vigo County

Table 1: Importance of Road

Rating Topic	How to Rate	Total Points
Vehicle Traffic	One point per 1000 vehicles per day	14
Detour	One point per two minutes lost in nearest state available detour	20*
* Temporary crossovers needed \$500,000		
Total Points for this table:		34

Table 2: Maintenance History

Rating Topic	How to Rate	Total Points
Total Visits by INDOT Maintenance	Five points per visit in past year (may have to estimate)	20
Type of Maintenance	Five points for slope, ten points for pavement	25*
Length of Maintenance	One point per five feet of pavement plus slope maintenance	18
* 15 for sheet pile wall in slope 10 for pavement		
Total Points for this table:		63

Table 3: Slope

Rating Topic	How to Rate	Total Points
Length from Tipline to Tipline	One point per 25 feet of length	14
Distance from Pavement	30 points if affecting, 25 points if adjacent, 20 points if within five feet, 10 points if within 20 feet, otherwise zero points	30
Distance from other Structures	Five feet, 10 points if within 20 feet, otherwise zero points	30
Length from Scarp to Toe Bulge	One point per 5 feet of length	16
Vertical Displacement of Scarp	Three points per inch	0
Horizontal Displacement of Scarp	Five points per inch	0
If the scarp and toe bulge are on opposite sides of the road beyond the pavement, add 20 points		
Total Points for this table:		95

Table 4: Pavement

Rating Topic	How to Rate	Total Points
Length of Pavement affected	One point per 5 feet of length	55
Width of Pavement affected	One point per foot of width	2
Vertical Displacement of Pavement	Ten points per inch (may have to estimate)	200
Horizontal Displacement of Pavement	Twenty points per inch (may have to estimate)	0
Total Points for this table:		257

Total Points for this Page = 479

Table 5: Site Conditions

Rating Topic	How to Rate	Total Points
Slope Rate	3.5:1 – 0 points, 3:1 – 3 points, 2.5:1 – 10 points, 2:1 – 20 points, 1.5:1 – 30 points, 1:1 – 45 points, Steeper than 1:1 – 75 points	20
Slope height	One point per 2 feet of height	80
Total Points for this table:		100

Table 6: Potential Future of the Slide if not corrected (estimate for next ten years)

Rating Topic	How to Rate	Total Points
Catastrophic Failure Possibility	Four points times estimated percent chance of catastrophic failure	20
Potential Cost Increase	Two points times estimated percent chance of cost increase	0
Current Hazard	Four points times estimated percent chance of dangerous accident	20
Total Points for this table:		40

Table 7: Other Intangible Issues Related to the Slide

This table can be used if the person inspecting the slide feels like there are reasons other than what is listed in the above six tables, for adding points to this slide. In general, the amount of points added should be less than 20 if the issue is of minor concern, 20 points if the issue is of medium concern, and more than 20 points if the issue is of serious concern.

Rating Topic	Total Points
Total Points for this table:	

Use the following space to provide more details about any issues listed in Table 7 (use back of page if needed):

Total points from Page 1: 479

Total Points from page 2: 140

Grand Total Points for this Slide: 619

Prioritization – Photos of SR 62



Prioritization – Ratings Sheet for SR 62

Guidelines for Rating the Necessity to Repair Landslides

Slide Information and Location: SR 62 Spencer County Route Post 75+03
 (Road, County, and RP needed)

Table 1: Importance of Road

Rating Topic	How To Rate	Count	Modifier	Total
Vehicle Traffic	1 point per 1000 vehicles per day	2400	/1000	2
Detour	1 point per two minutes lost in nearest state available detour	4	/2	2
Road Specifics	25 points for major point of public interest			-
Total Points for this table:				4

Table 2: Maintenance History

Rating Topic	How to Rate	Count	Modifier	Total
Total Visits by INDOT Maintenance	5 points per visit in past year (may have to estimate)	1	*5	5
Type of Maintenance	10 points for slope plus 20 points for pavement			10
Length of Maintenance	1 point per five feet of pavement plus slope maintenance	25	/5	5
Total Points for this table:				20

Table 3: Slope

Rating Topic	How to Rate	Count	Modifier	Total
Length from Tipline to Tipline	1 point per 20 feet of length	115	/20	6
Distance from Pavement	30 points if affecting, 25 points if adjacent, 20 points if within 10 feet, 10 points if within 20 feet, otherwise zero points			30
Distance from other Structures				0
Length from Scarp to Toe Bulge	1 point per 5 feet of length	30	/5	6
Vertical Displacement of Scarp	3 points per inch	1	*3	-
Horizontal Displacement of Scarp	5 points per inch		*5	-
If the scarp and toe bulge are on opposite sides of the road beyond the pavement, add 20 points				-
Total Points for this table:				42

Table 4: Pavement

Rating Topic	How to Rate	Count	Modifier	Total
Length of Pavement affected	1 point per 5 feet of length	80	/5	16
Width of Pavement affected	1 point per foot of width			13
Vertical Displacement of Pavement	10 points per inch (may have to estimate)	2	*10	20
Horizontal Displacement of Pavement	20 points per inch (may have to estimate)	1/2	*20	10
Total Points for this table:				59

Table 5: Site Conditions

Rating Topic	How to Rate	Count	Modifier	Total
Slope Rate	3.5:1 - 0 points, 3:1 - 3 points, 2.5:1 - 10 points, 2:1 - 20 points, 1.5:1 - 30 points, 1:1 - 45 points, Steeper than 1:1 - 75 points			3
Slope height	1 point per 2 feet of height	16	/2	8
Total Points for this table:				11

Table 6: Potential Future of the Slide if not corrected (estimate for next ten years)

Rating Topic	How to Rate	Total
Road Closure Possibility	None = 0 points, Low = 20 points, Medium = 100 points, High = 300 points	100
Potential Cost Increase	None = 0 points, Low = 10 points, Medium = 100 points, High = 200 points	10
Current Hazard	None = 0 points, Low = 20 points, Medium = 100 points, High = 300 points	30
Total Points for this table:		130

Table 7: Other Intangible Issues Related to the Slide

This table can be used if the person inspecting the slide feels like there are reasons other than what is listed in the above six tables, for adding points to this slide. In general, the amount of points added should be less than 20 if the issue is of minor concern, 20 points if the issue is of medium concern, and more than 20 points if the issue is of serious concern.

Rating Topic	Total Points
Total Points for this table: _____	

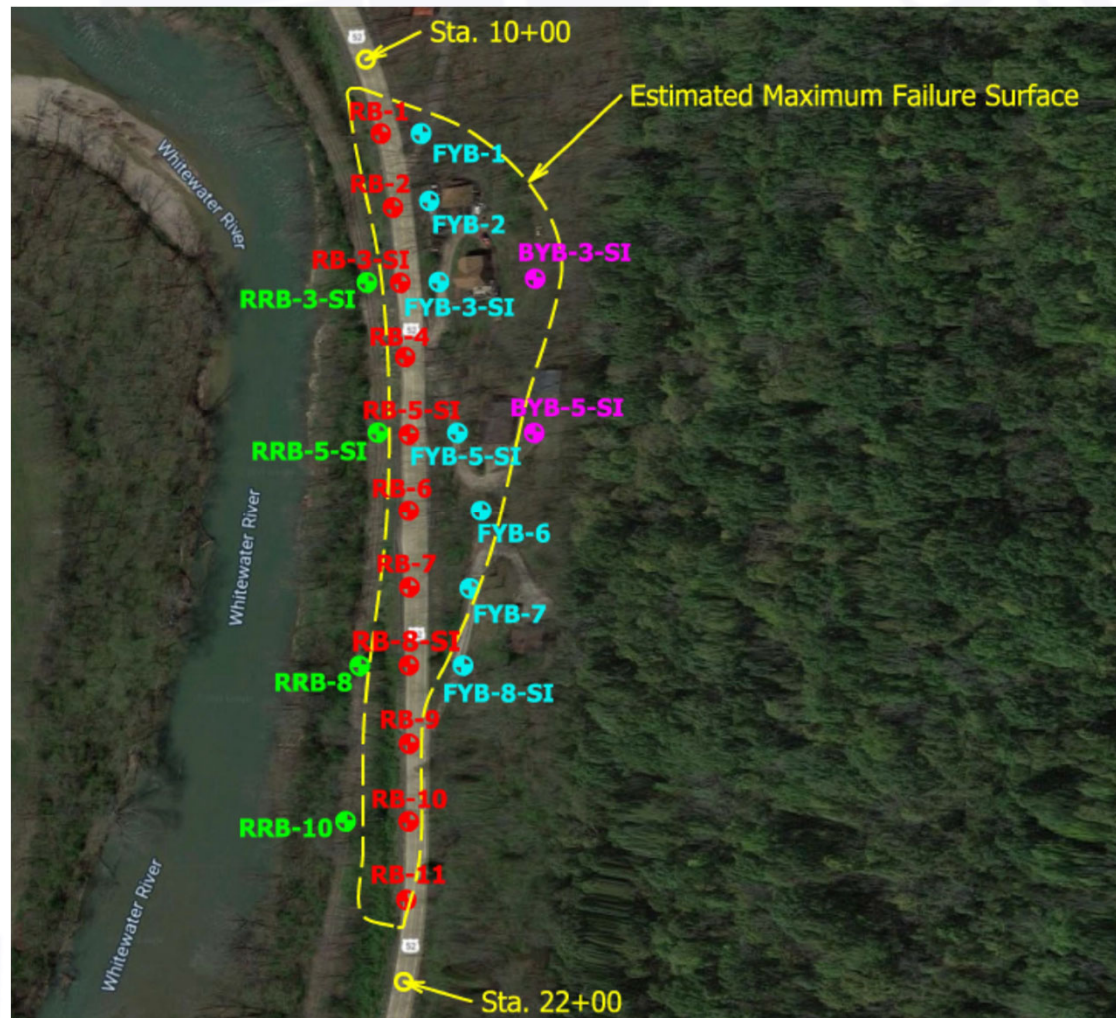
Use the following space to provide justification for any high ratings on Table 6 or more details about any issues listed in Table 7 (use back of page if needed):

Total points from Page 1: 125

Total Points from page 2: 141

Grand Total Points for this Slide: **266**

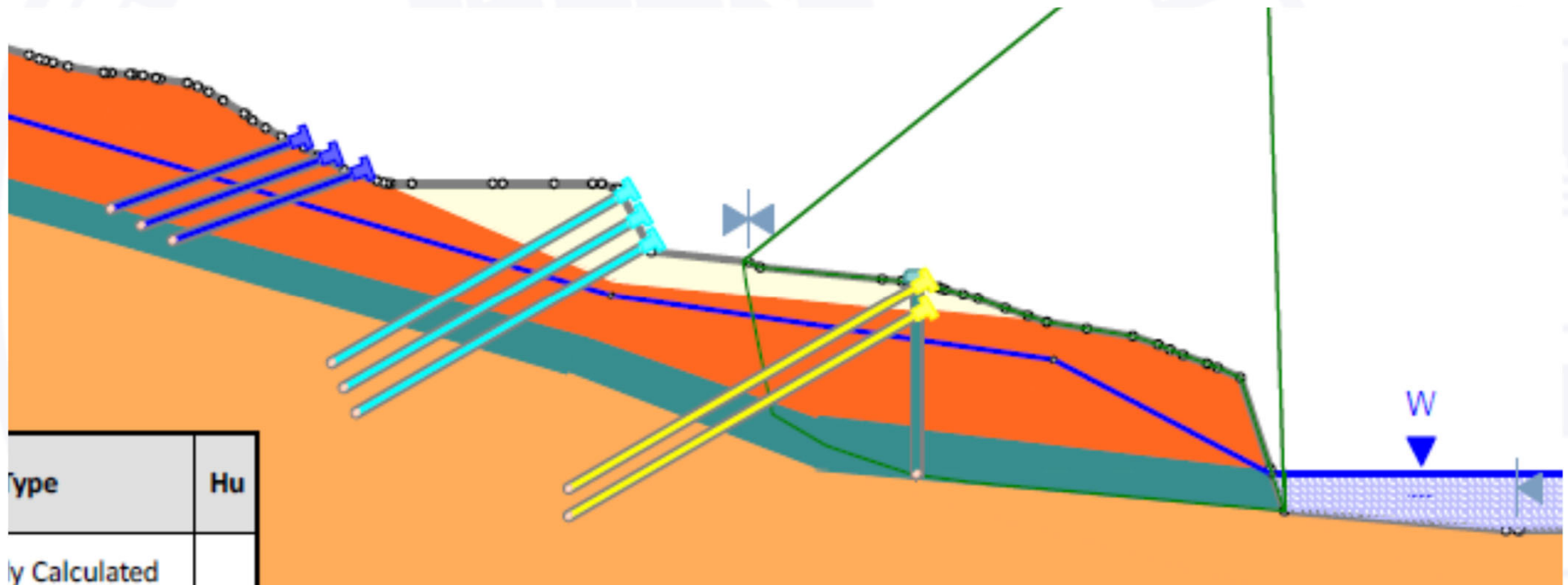
Emergency Slide on US 52



Emergency Slide on US 52 in Franklin County



Correction of Emergency Slide on US 52



US 52 Correction



US 52 Correction



Questions?

