

Resilience Improvement Plan

- Strategies
- Toolbox (Countermeasures)
- Research
- Update Schedule
- Next Steps



Resilience Improvement Plan: Review of Chapter 3

- Results of hazard assessment



Drought



Tornado/
Windstorm



Flooding



Winter
Storms



Hail &
Thunderstorms



Excessive
Heat



Dam / Levee
Failure



Landslide



Freeze/Thaw

Prioritization Activity

Risk Consequence Matrix					
	Values	L X I = Consequence			
Almost Certain	5	5	50	200	350
Probable	4	4	40	160	280
Possible	3	3	30	120	210
Rare	2	2	20	80	140
Exceptionally Rare	1	1	10	40	70

Values			
1	10	40	70
Low	Moderate	High	Severe

Impact

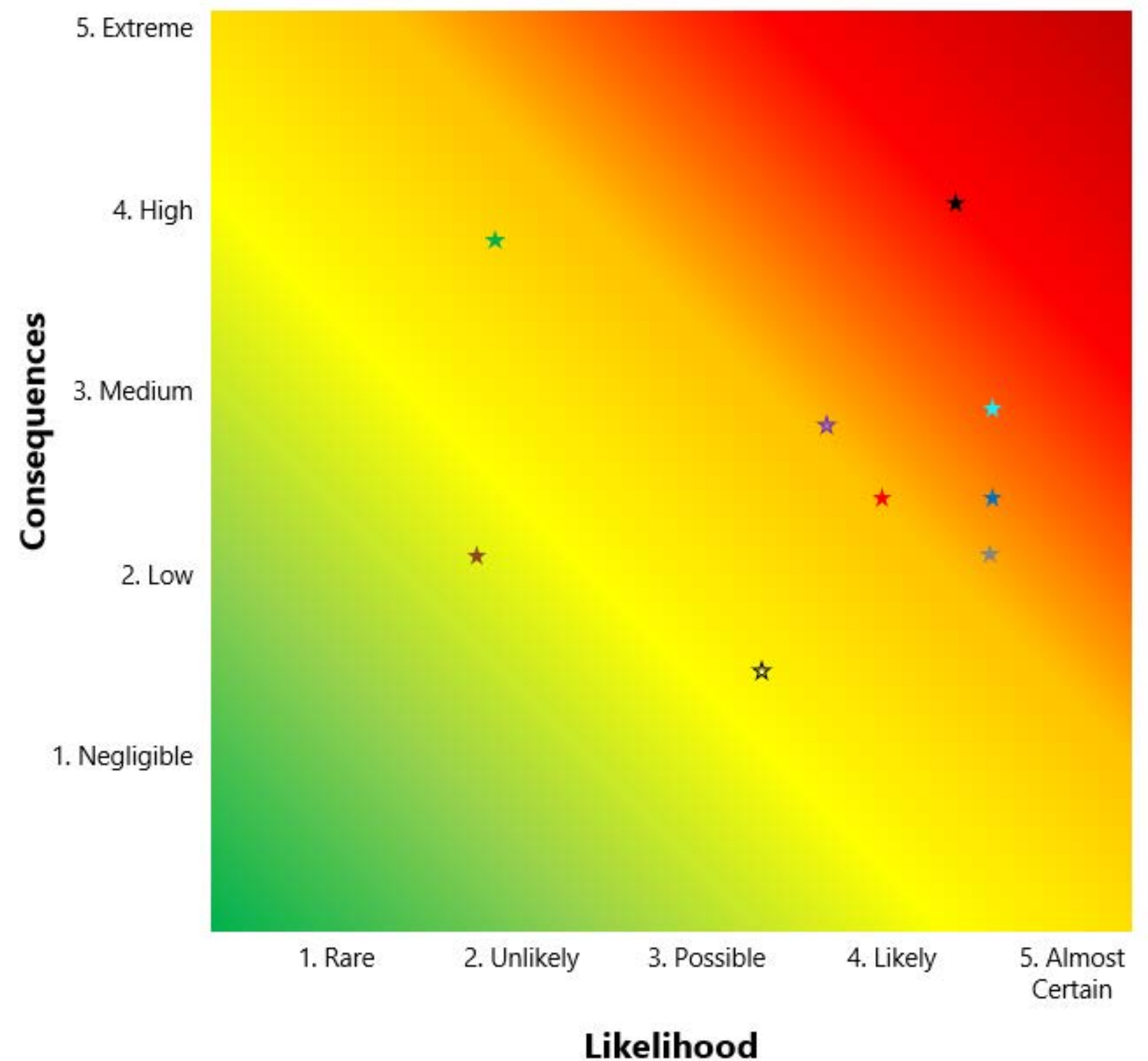
Likelihood x Consequence = Risk



Resilience Improvement Plan: Review of Chapter 3

- Results of hazard assessment

	Likelihood	Consequence	Risk
Flooding	4.02	3.94	15.83
Winter Storms	4.27	2.88	12.28
Freeze / Thaw	4.23	2.38	10.04
Tornado / Windstorm	3.31	2.77	9.18
Hail & Thunderstorms	4.23	2.02	8.55
Drought	3.60	2.33	8.41
Excessive Heat	3.69	1.69	6.22
Dam / Levee Failure	1.58	3.71	5.87
Landslide	1.42	2.02	2.86



Resilience Improvement Plan: Review of Chapter 3

- Response categories

	Likelihood	Consequence	Risk	
Flooding	4.02	3.94	15.83	Proactive Response
Winter Storms	4.27	2.88	12.28	
Freeze / Thaw	4.23	2.38	10.04	
Tornado / Windstorm	3.31	2.77	9.18	Reactive Response
Hail & Thunderstorms	4.23	2.02	8.55	
Drouaht	3.60	2.33	8.41	
Excessive Heat	3.69	1.69	6.22	Monitor Response
Dam / Levee Failure	1.58	3.71	5.87	
Landslide	1.42	2.02	2.86	

Resilience Improvement Plan: Review of Chapter 3



Grey infrastructure



Green infrastructure



Policy measures



Co-beneficial improvements



Resilience Improvement Plan: Chapter 4

- Proactive Response

	Likelihood	Consequence	Risk
Flooding	4.02	3.94	15.83
Winter Storms	4.27	2.88	12.28
Freeze / Thaw	4.23	2.38	10.04

Proactive Response

- Strategies

- Road design addressing snow drifting & drainage
 - More ROW needs and acquisition (living within the existing ROW)
- Climate change and resiliency bridge design policy (Bridge Design Manual)
- Communication with local communities in regards to flood management
- Maintaining pavement joints? (how do we improve this) Bridge-integral abutments

- Countermeasures

- Example: Flexamat
- Low visibility navigation for plow (research also)
- Snow fencing (as part of road design from start of projects)
 - Permanent installations (identify ways of making these activities more attractive)
- Native Plantings

- Research

- Example: RIDB database development
- Examine capacity to do BCA analysis

Resilience Improvement Plan: Chapter 4

- Reactive Response

- Strategies

- Burying utilities in ROW
 - Drought – transporting of water/feed on the system during these events.

- Countermeasures

- Investment in vegetation management equipment
 - Proactive vegetation management? Ash tree removal
 - Mini landslides
 - Clear zone policy

- Research

- Example:

	Likelihood	Consequence	Risk
Tornado / Windstorm	3.31	2.77	9.18
Hail & Thunderstorms	4.23	2.02	8.55
Drought	3.60	2.33	8.41

Reactive Response

Resilience Improvement Plan: Chapter 4

- Monitor Response

- Strategies

- Office of Levee Safety coordination

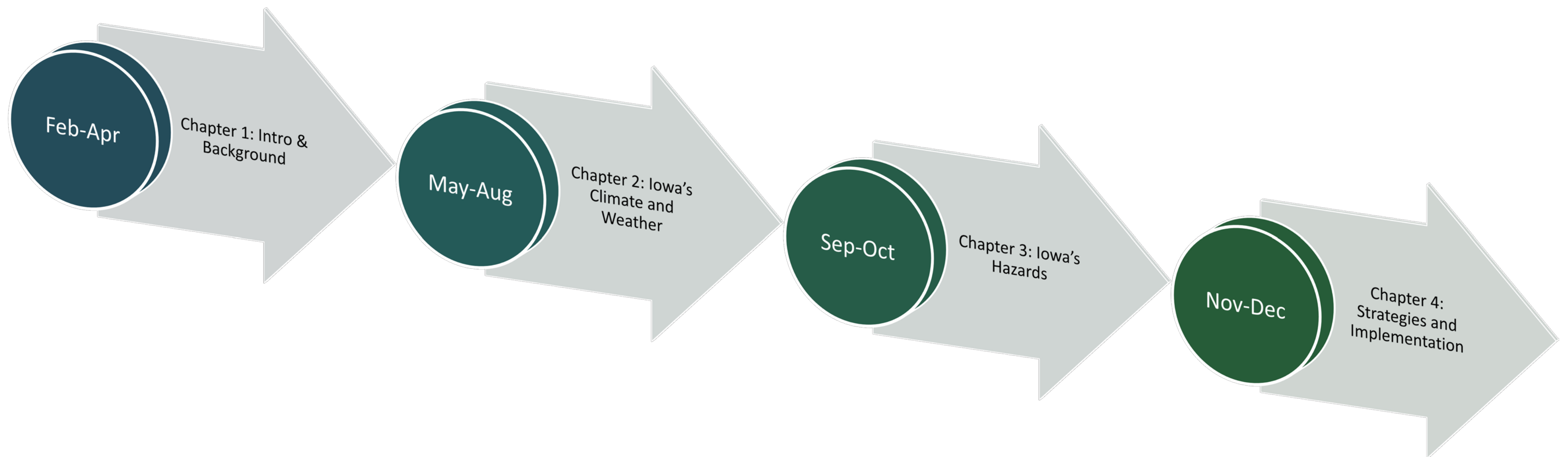
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Monitor Response



Resilience Improvement Plan: Update Schedule

- Where are we in the process?



Resilience Improvement Plan: Next Steps

- Draft Chapter 4
- Finalize Draft RIP
 - Finish all edits
 - Develop maps and graphics
 - Final internal review
- Review by RWG
 - Integrate edits and comments
- Review by FHWA
- Publish

Resilience Improvement Plan: Next Steps

- Who is interested in reviewing Chapter 4?
 - Jim
 - Krista
 - Jack