

Securing Global Transportation Networks; A Total Security Management Approach

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Chapter 4: The Risk Management Approach to TSM

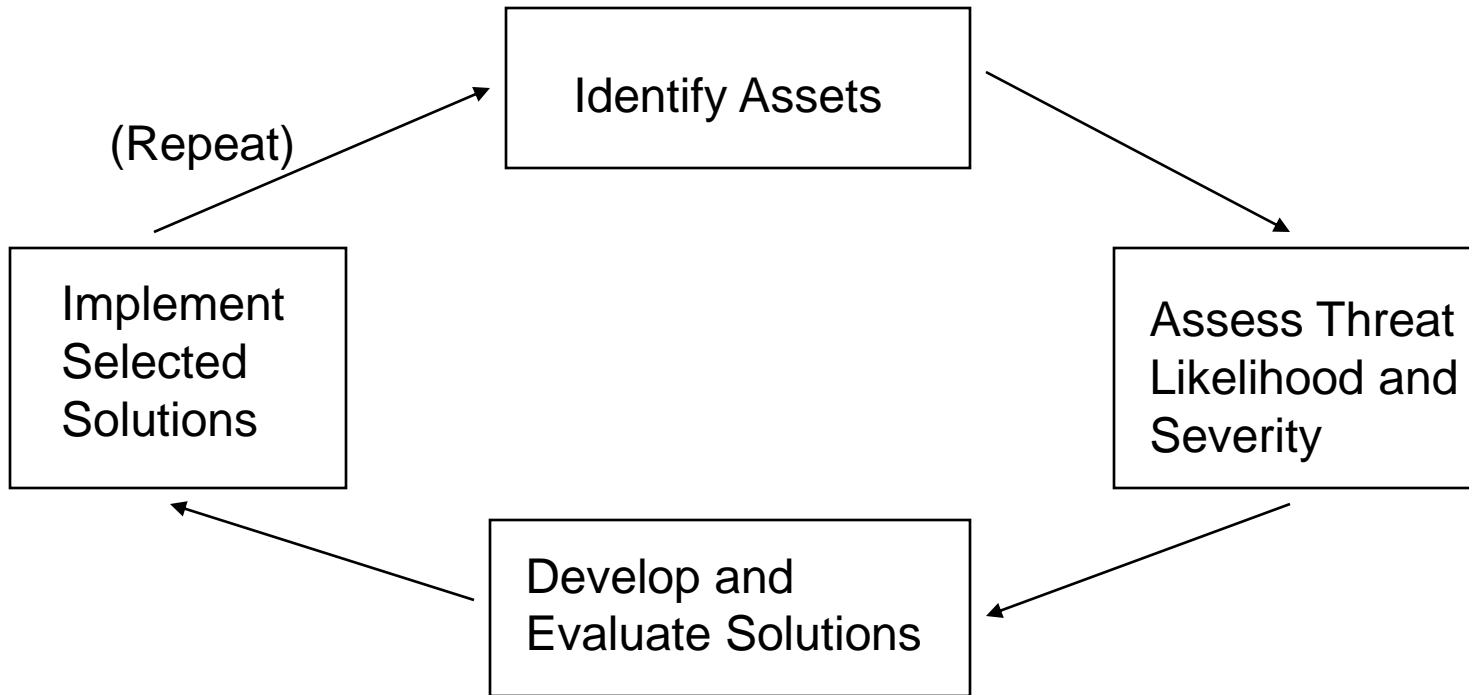
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CEIE 686/499

Transportation System Security & Safety

September 2, 2008

Figure 4.1: The Risk Management Cycle



Objective is to manage the tradeoff between up front security costs vs the potentially catastrophic costs of discontinuous events.

Analyzing Risk

- Risk = (Likelihood of Occurrence) x (Severity of Consequences)
- *Vulnerability Assessment (VA)* tools are all similar to that developed by Sandia National Laboratories.
- *Value Chain Risk Mapping* extends the VA to all relevant partners.

Estimating Likelihood

- Historical record
 - Works best for natural hazards
- Analysis of plausible threats
 - Essential when dealing with human-caused events

Estimating Severity

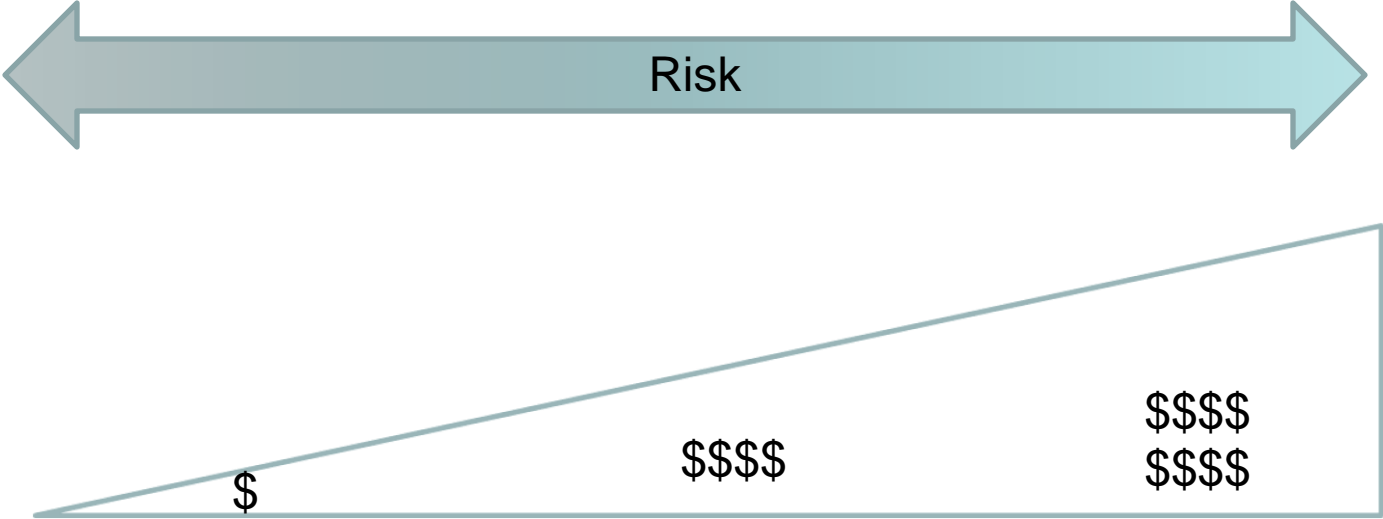
- Identify critical assets
 - Estimate costs of full or partial loss
- Assess adequacy of current protective measures
 - A goal is system *resilience*

Figure 4.5: Risk Matrix

Severity	Likelihood					
	Impossible	Improbable	Remote	Occasional	Probable	Frequent
Catastrophic	Green	Green	Yellow	Red	Red	Red
Critical	Green	Green	Green	Yellow	Red	Red
Marginal	Green	Green	Green	Green	Yellow	Yellow
Negligible	Green	Green	Green	Green	Green	Green

See tables 4.3, 4.4 for example severity and likelihood scales.

Fig. 4.6: Risk Mitigation Alternatives



Minimal
Least Cost
Highest Risk

Moderate
Middle Cost
Medium Risk

Aggressive
Greatest Cost
Lowest Risk

Risk Mitigation Considerations

- Predicted risk reduction
- Implementation and maintenance costs
- Effect on daily operations
- Unintended consequences
 - Reduced efficiency
 - Risk shifting
- Optimal risk portfolio is different for each company.

Appendix A

Risk and Vulnerability Assessment Report Template