Performance-Based Earthquake Engineering Needs

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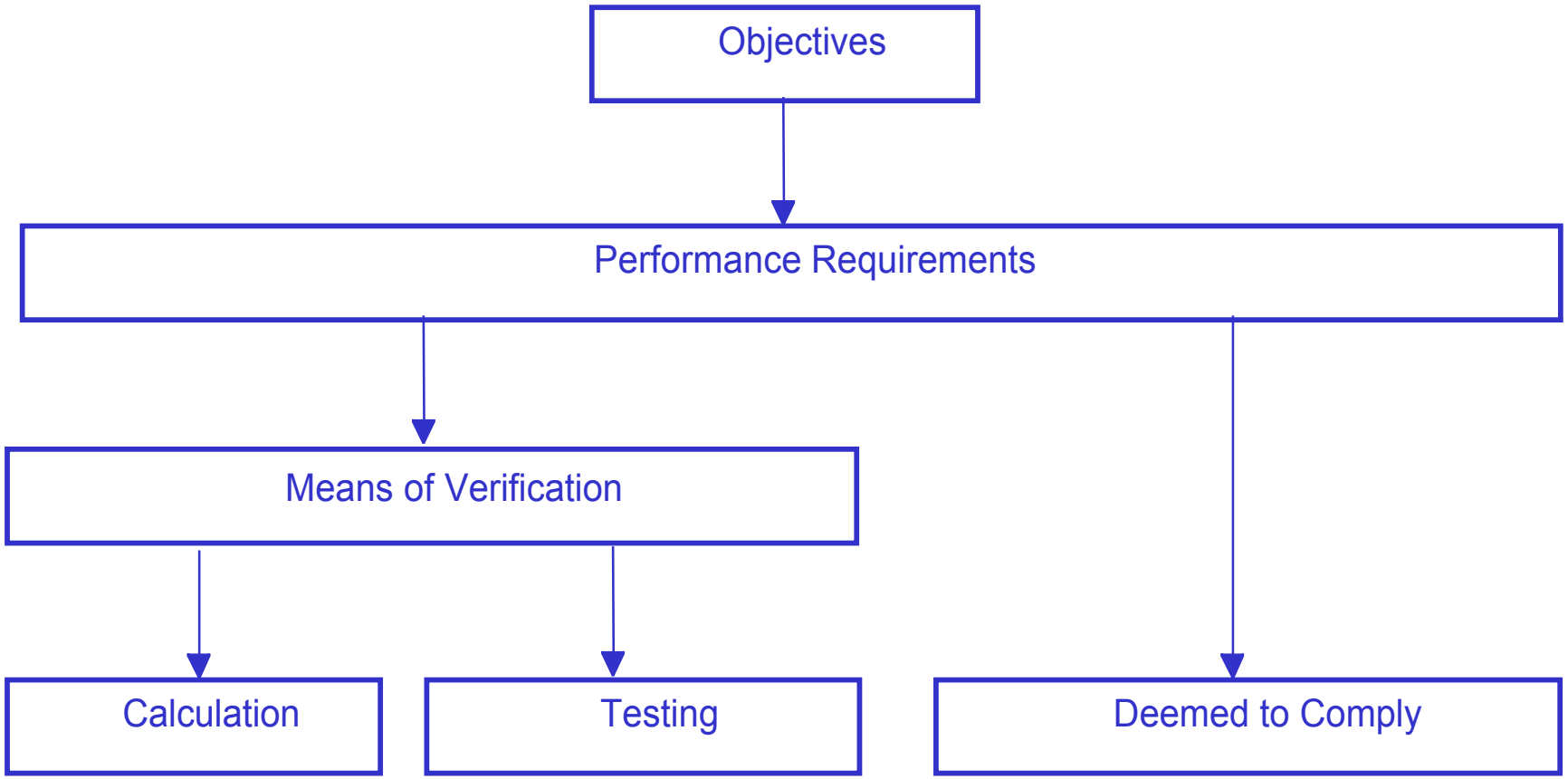
2001 PEER Annual Meeting

Performance Based Building Codes

- Original Concept
  - Alternate to prescriptive solutions
  - Provide transferability of designs
- Long history of Performance Based Codes in Fire Protection and other disciplines
- Reasonable to start with this Performance Based Code *Process*

Traditional Performance-Based Code Process



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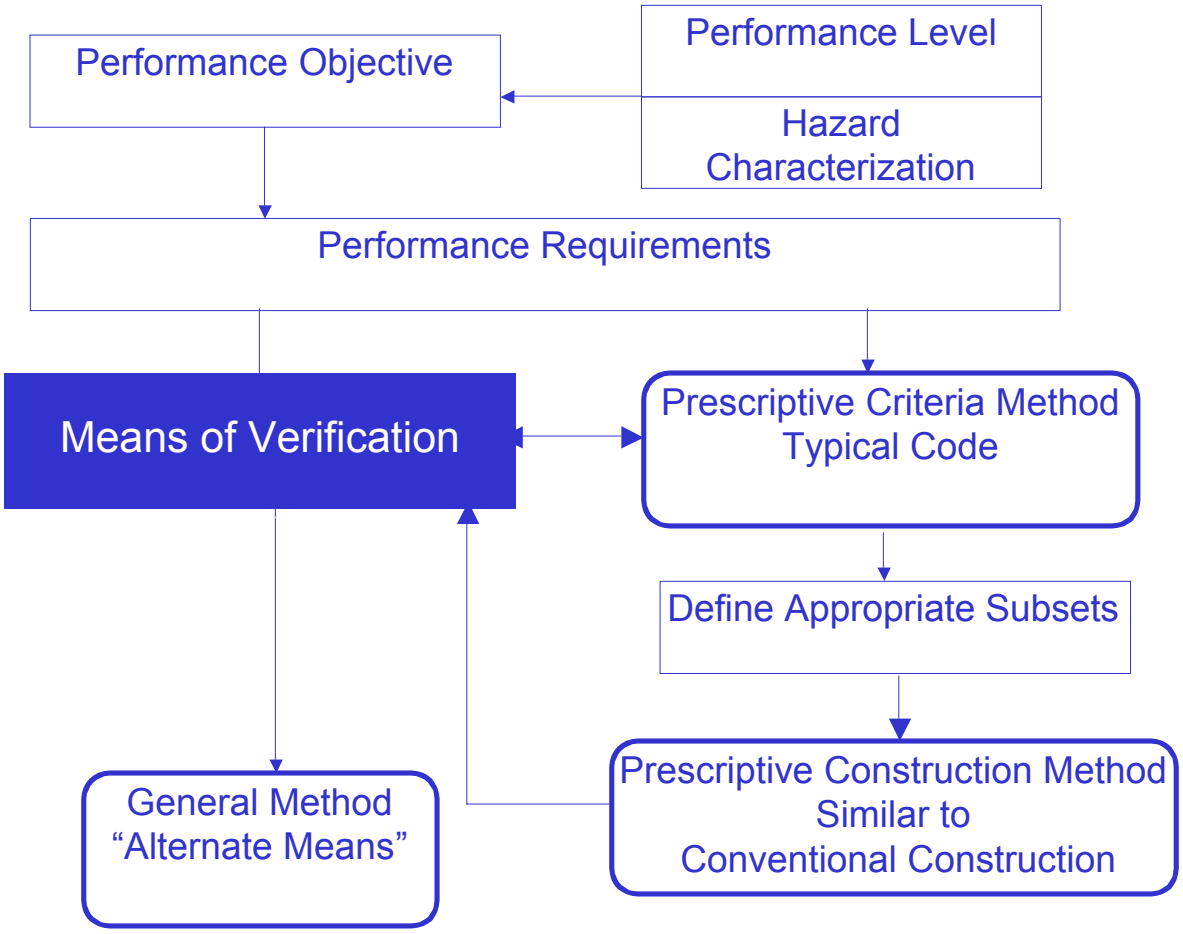
Traditional Process Applied to Earthquake Engineering Codes



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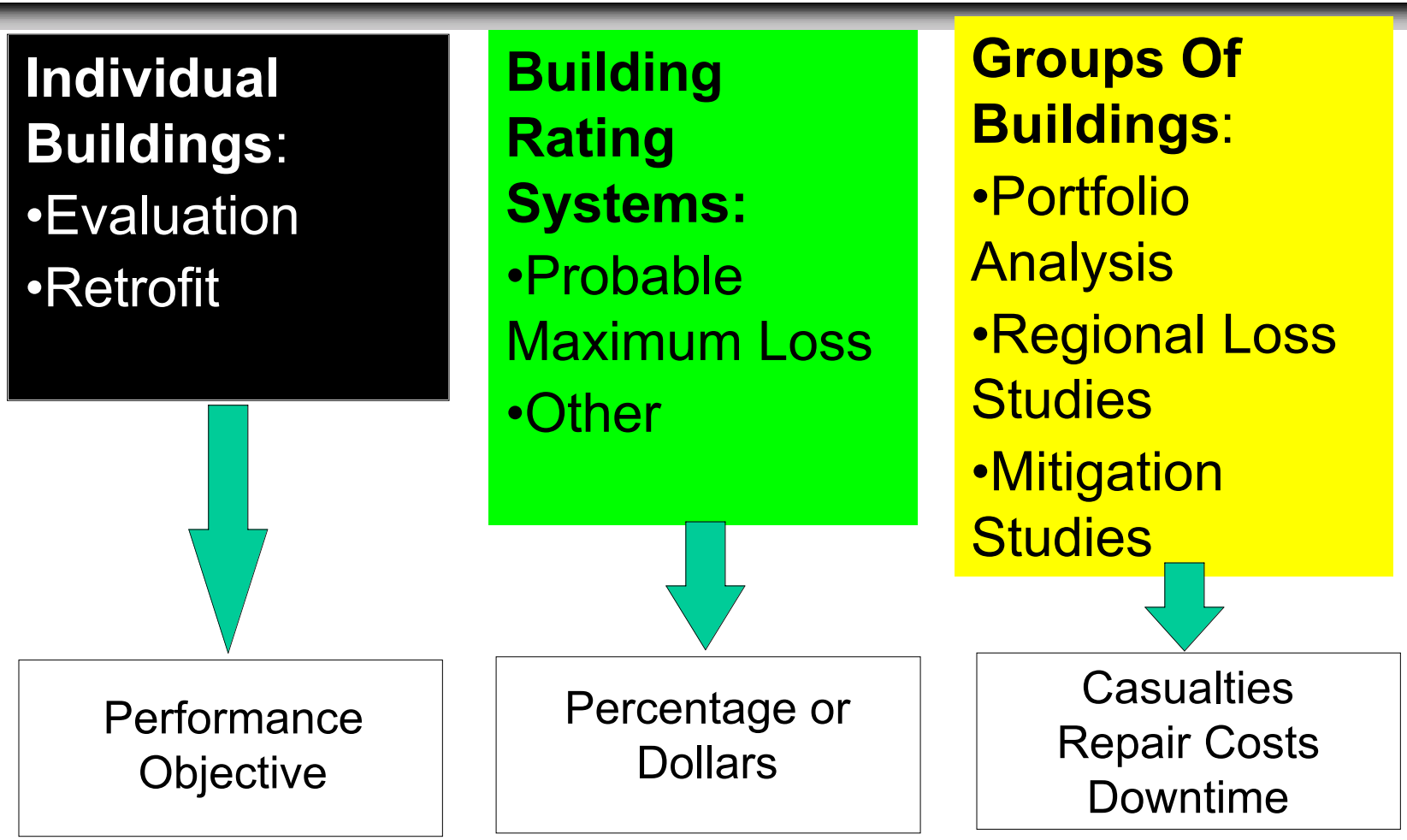
A Broader View of Earthquake Engineering

- Design of New Buildings
  - Prescriptive "complete" method
  - Simplified methods
- Individual Existing Buildings
  - Evaluation
  - Retrofit
  - Determination of expected losses
- Groups of Buildings
  - Risk analysis
  - Economic portfolio analysis
  - Regional loss studies
- Research and Reconnaissance

Integration of all Uses



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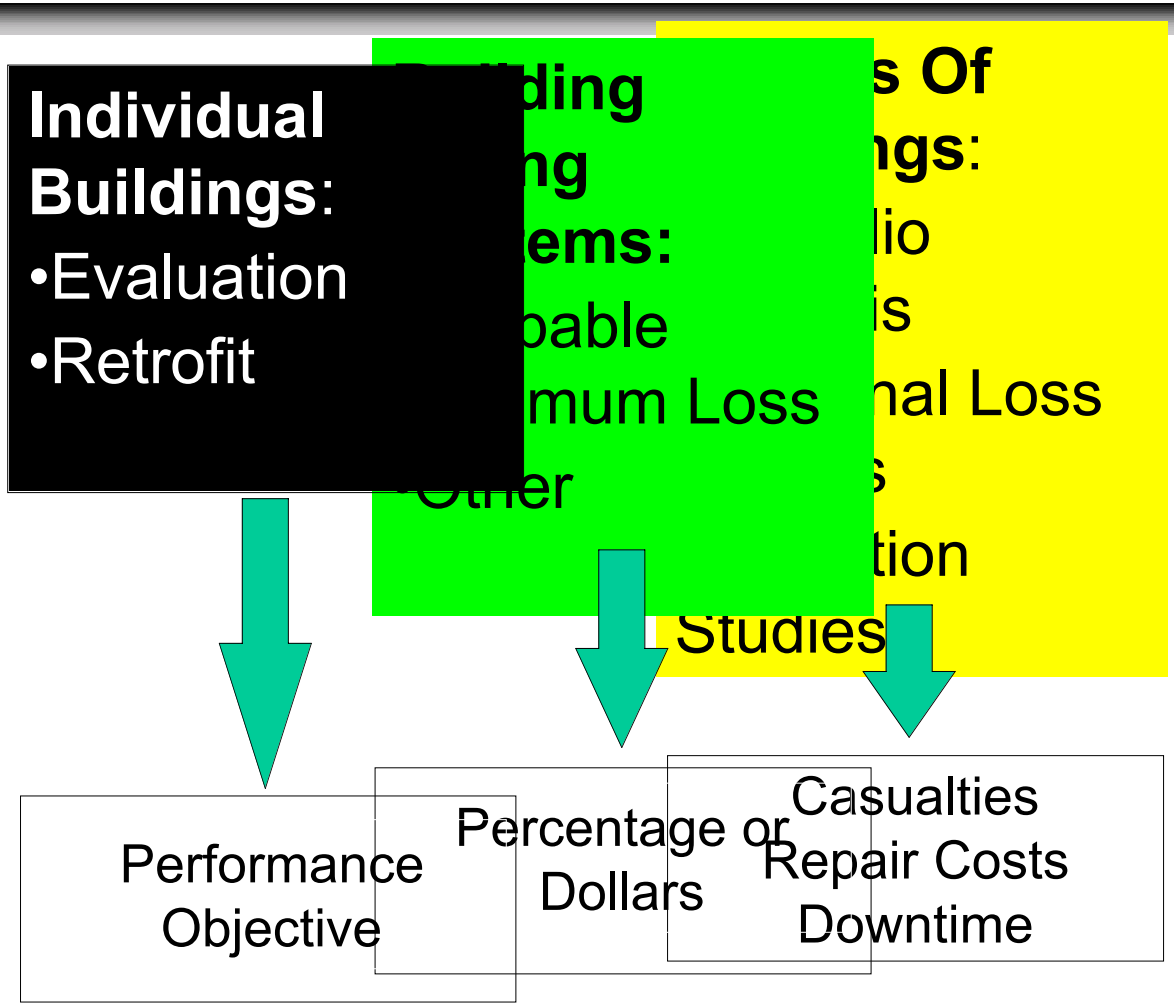
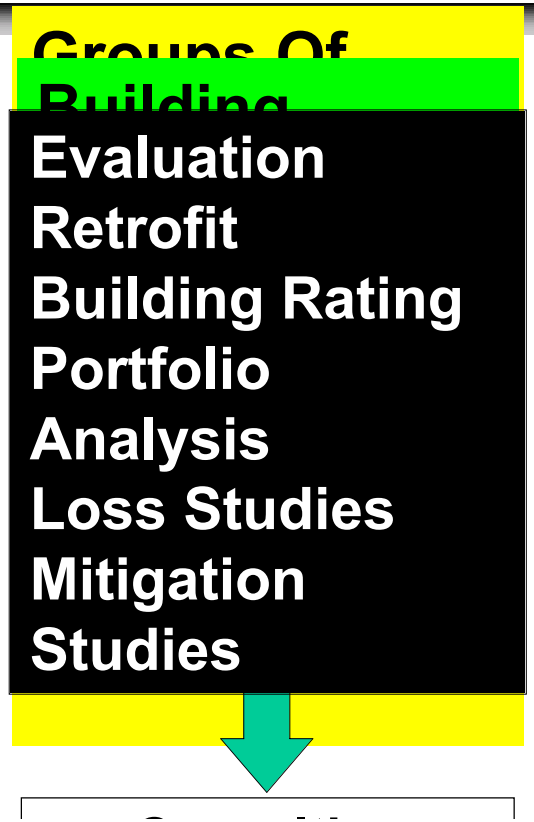
Integration of all Uses



Unified Performance System



Means of Verification

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Interest and Demand from Stakeholders

	Stakeholders					
Uses	Designers	Building Officials	Owners	Lenders Insurers	Govern-ment	Emer. Planners
New Design	■	■	■			
Evaluation	■	■	■			
Retrofit	■	■	■			
Building Rating	■		■	■		
Risk Studies			■	■	■	
Regional Loss					■	■

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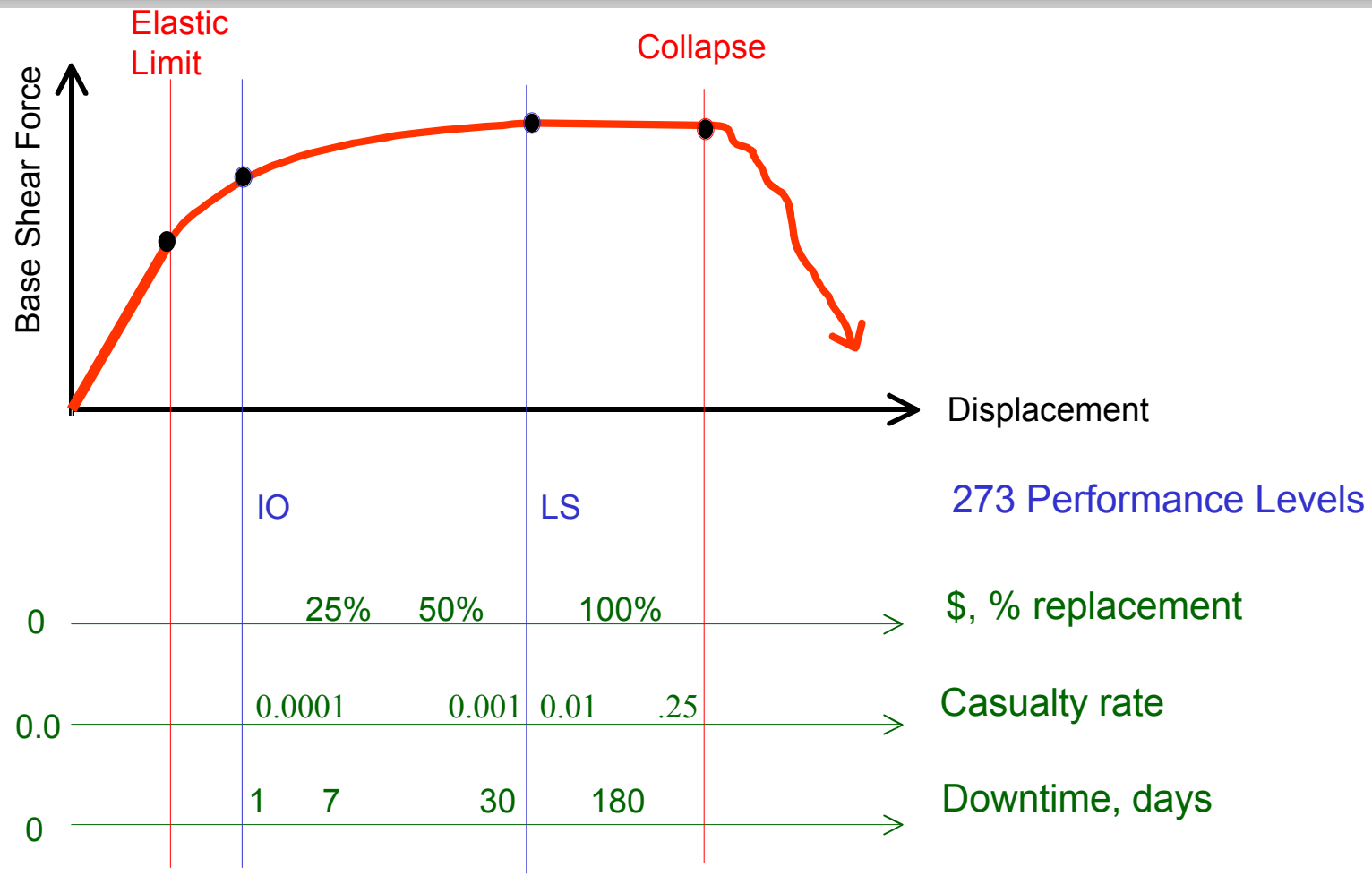
Pushover and Performance



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Summary

- **An accepted "performance engine" (means of verification) is needed to fulfill the promise of performance-based earthquake engineering**
- **Fully developed performance-based earthquake engineering will form a common base for all aspects of the profession**
- **Performance levels must eventually be numerically tied to the losses of interest:**
  - **direct $ loss**
  - **casualty loss**
  - **loss of function**

Thank you