

Risk In Design Build Metro North Railroad Yankee Stadium Station

CSVA 2011 Conference
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Stuart Sokoloff PE, P.ENG
(ONTARIO)

TORONTO ZOMBIES

'Zombies' hurt . . . but they're still alive!

TORONTO — Screen actors dressed as zombies were injured Saturday when they fell from a platform during filming of a new movie in the "Resident Evil" series. And rescue workers at first were stun-

ned by the seemingly catastrophic scene.

"I could see the look on the first paramedics' faces. Oh my God," emergency medical services chief David Kohn said with a laugh.

The victims' gore zombie

costumes made it difficult for crews to assess the severity of their injuries, said a medical worker at Toronto's Cineplex Theatre Studios.

"Resident Evil: Retribution," with lead actress Milla Jovovich, is the fifth

installment of a franchise based on the popular video-game series.

Twelve victims were taken to a hospital. Filmmakers said none of the injuries was considered life-threatening. AP

WHAT IS RISK?

“The chance of a negative event”

RISK: ACCORDING TO WHO?

PERSPECTIVES

- OWNER
- PUBLIC
- DESIGNER
- BUILDER
- DESIGN-BUILDER

RISKS

- DELAY/SCHEDULE (CONSTRUCTION)
- CHANGED CONDITIONS (CONSTRUCTION)
- ERRORS/ OMISSIONS (DESIGN)
- APPROACH (DESIGN)

RISK : DESIGN BUILDER

- **BID**

Too high: no project

Too low: lose money

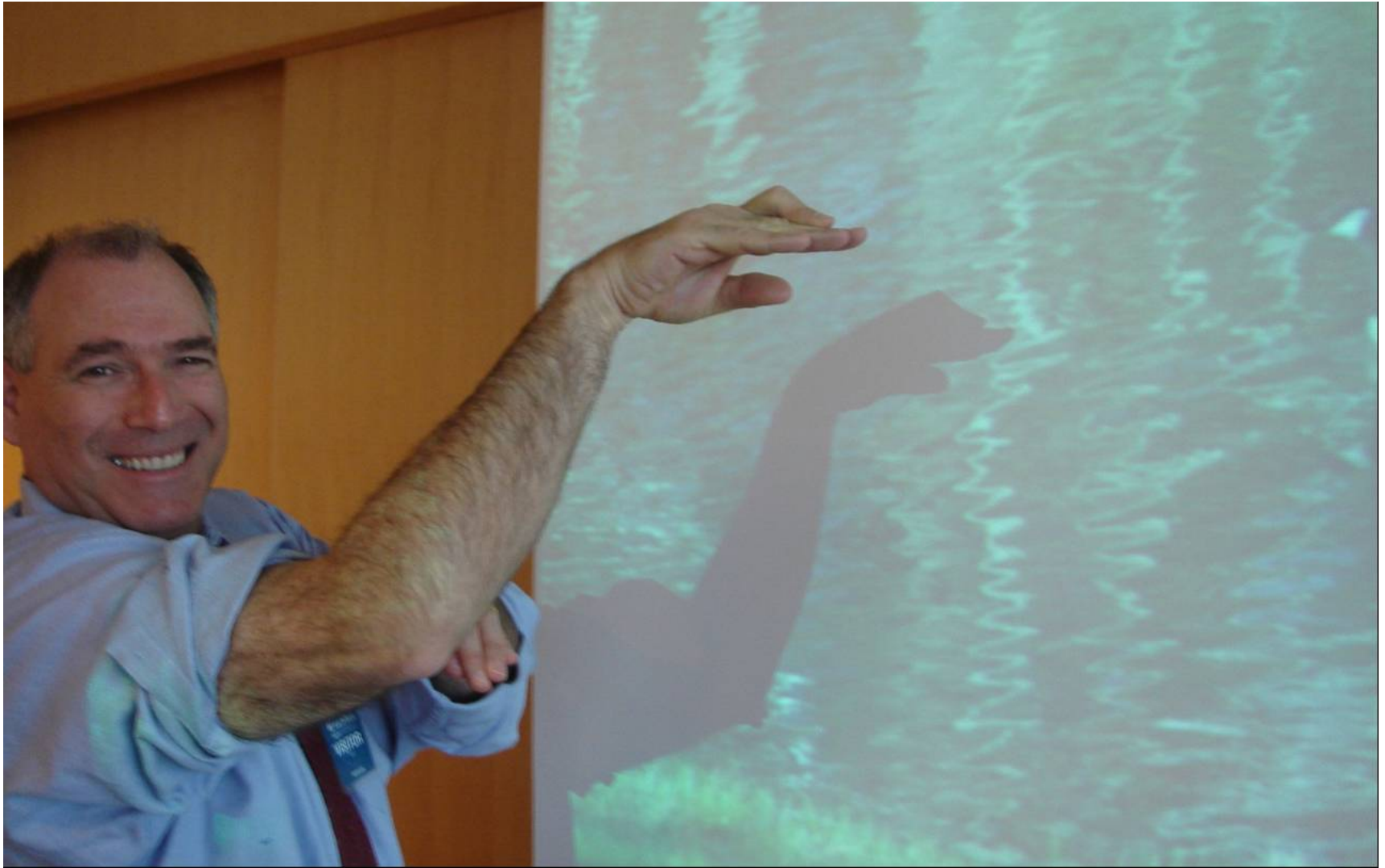
- **ALTERNATE APPROACH
(TECHNICAL)**

Shared with others

Not accepted

- **DELAYS/ DAMAGES**





TUXEDO APPROACH: REGISTER

RISK ITEM

PROBABILITY X SEVERITY = RATING



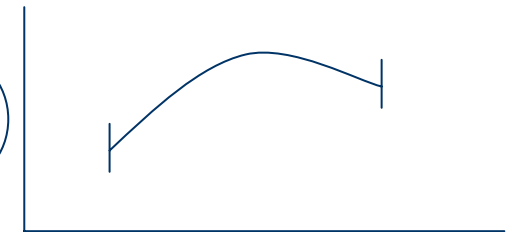
MITIGATION

PROBABILITY MODEL (MONTE CARLO, ETC)

SINGLE OR GROUPING (AVG. P)

- a) RANGE/LIKELIHOOD  % CHANCE
- b) ESTIMATE IMPACT  RANGE/LIMITS

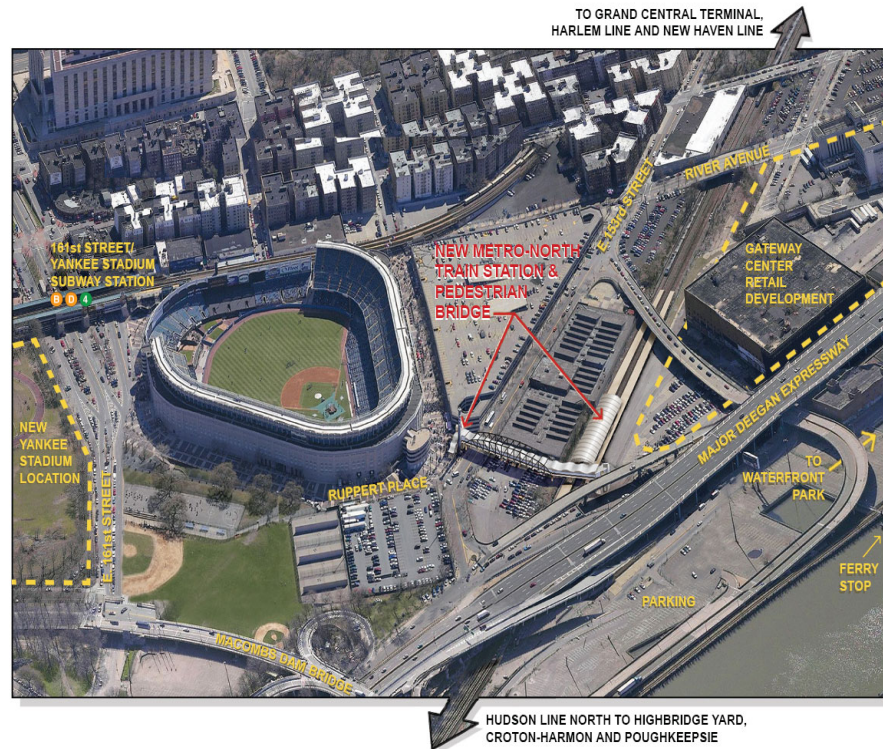
- c) COMPUTER
STIMULATIONS
- REVENUE
- SCHEDULE
- COST



IMPACT

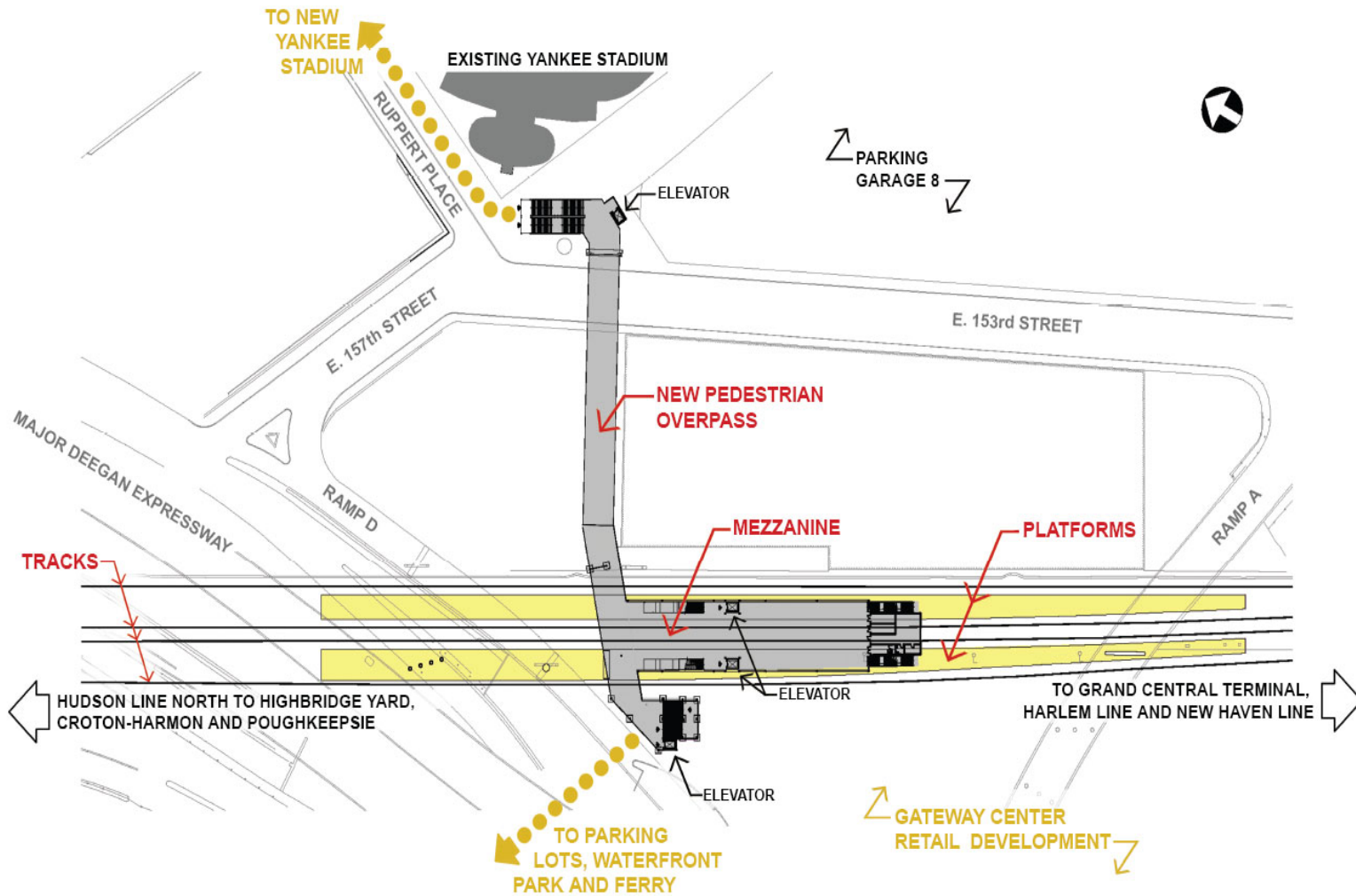
MNRR STATION @ NEW YANKEE STADIUM

- \$100 Million
- Two platforms
- Elevated station spanning track
- Track expansion and main tracks
- 260 ft covered pedestrian bridge



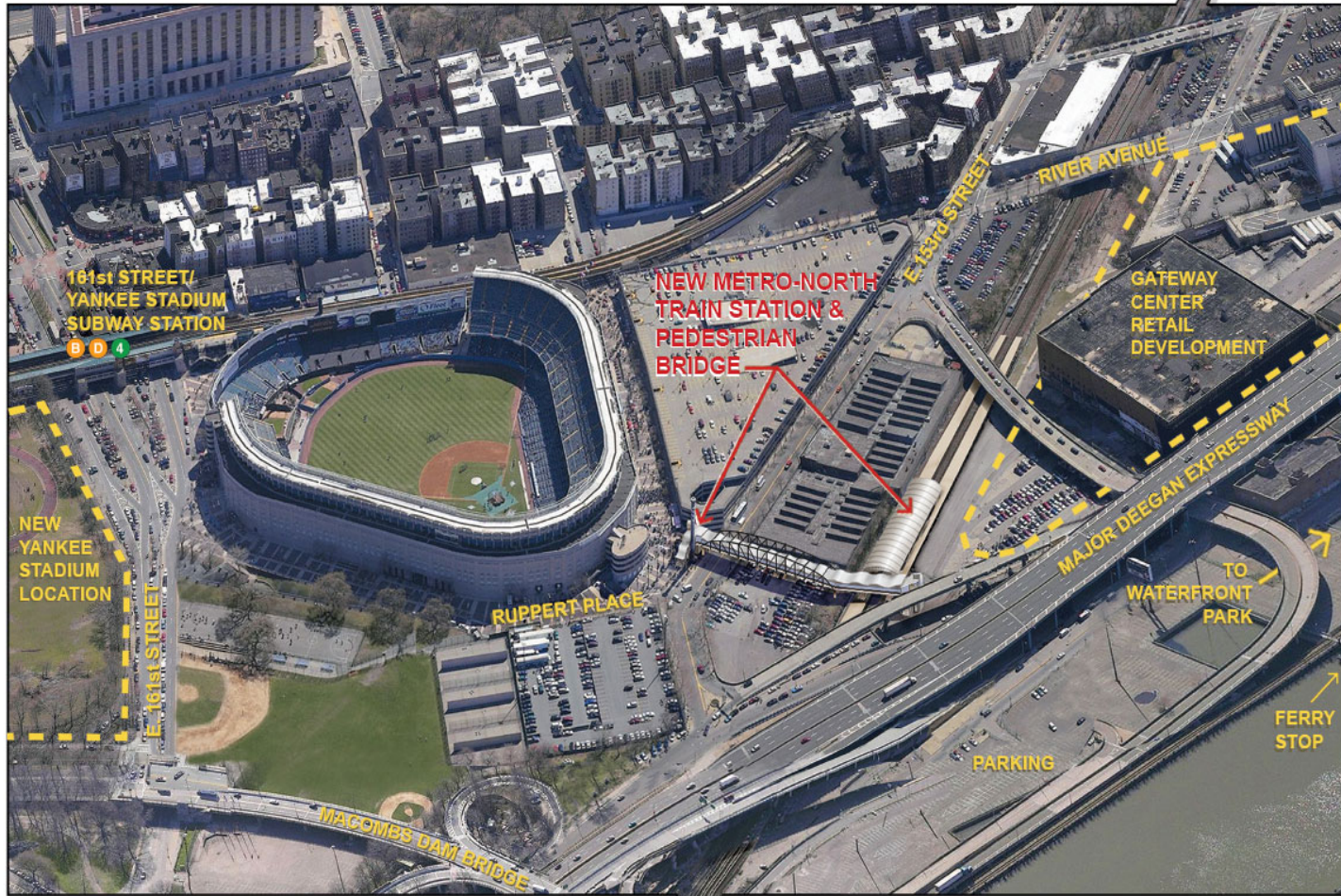
YANKEE STADIUM TRAIN STATION





YANKEE STADIUM TRAIN STATION

TO GRAND CENTRAL TERMINAL,
HARLEM LINE AND NEW HAVEN LINE



HUDSON LINE NORTH TO HIGHBRIDGE YARD,
CROTON-HARMON AND POUGHKEEPSIE

YANKEE STADIUM TRAIN STATION



CONSTRAINTS & CONDITIONS

- Weak soil: seismically vulnerable
- Deep rock
- Multiple soil types
- Mandated opening: Opening day
- Constrained linear site
- Work under live trains

DESIGN BUILDER SHADOW APPROACH: UNDEFINED

RISK:

CONTRACT DOCUMENTS
VS
ALTERNATIVE APPROACH

RISK

- Contract: New track over existing high
- ALTERNATE: Relocate feeder cables



RISK

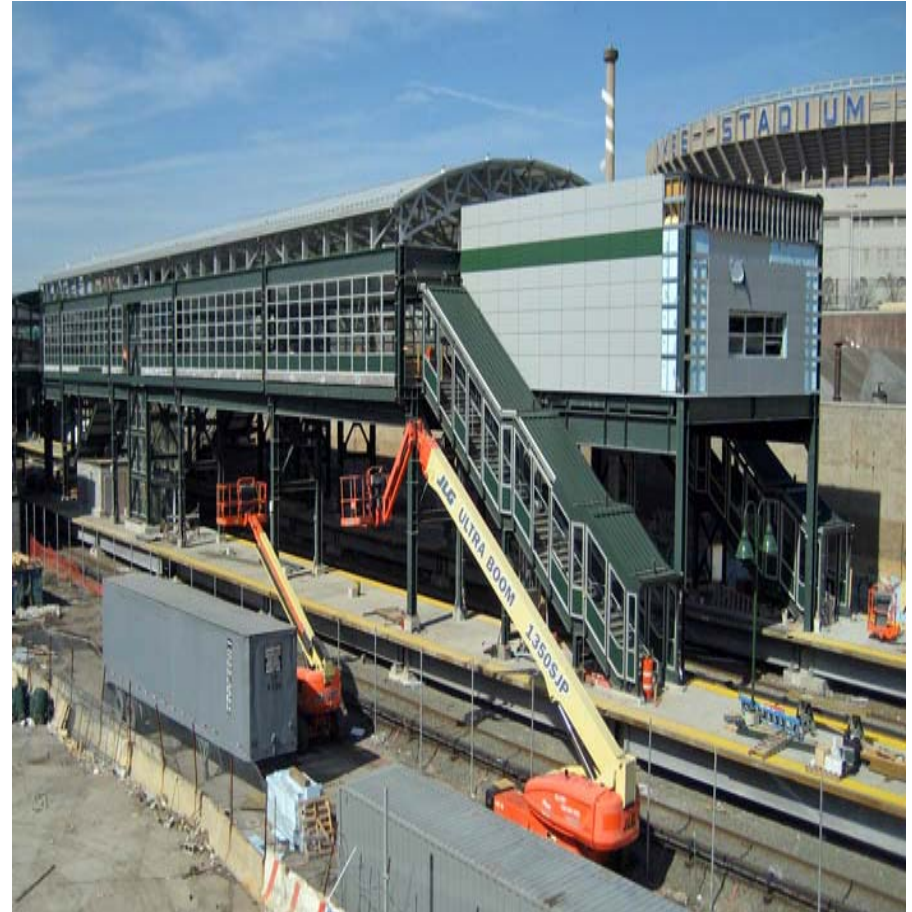
- CONTRACT: Mini-piles
- ALTERNATE: H piles

METRO-NORTH RAILROAD / YANKEE STADIUM STATION – DESIGN BUILD



RISK

- **CONTRACT:** Pot bearings on bridge
- **ALTERNATE:** Seismic bearings



RISK

- **CONTRACT:** Geopiers
- **ALTERNATE:** Bi-axial geogrid with ballast



RISK

- **CONTRACT:** Seismic classification
- **ALTERNATE:** Reinterpret cross hole test results



Topic Overview

- **CONTRACT:** 2 YEAR CONSTRUCTION
- **HOW:**
 - Precast bridge piers work in winter
 - Temp. bridge bearings (12" x 12" x 12")
 - H-piles ilo drilled mini-piles



VA & RISK > COMPATIBLE

VA IMPROVES VALUE

$$V = \frac{F}{\$} \frac{\text{VARIABLE}}{\text{VARIABLE}}$$

PROJECT RISK MITIGATION REDUCES THE CHANCE OF A NEGATIVE EVENT

$$V = \frac{F \uparrow}{\$ \downarrow}$$

VA QUANTIFICATION OF FUNCTIONALITY ALTERNATE IDEAS OR GROUPINGS

FUNCTIONALITIES	TEAM "AVG" RATINGS	BASELINE		ALT. 1		ALT. 2		...ALT X
A	10	5	50	8	80	6	60	
B	20	5	100	7	140	6	120	
C	30	5	150	3	90	7	210	
D	25	5	125	4	100	5	125	
E	15	5	75	5	75	4	60	
	<hr/> 100%		<hr/> 500		<hr/> 485		<hr/> 575	

RISK IN VA: MAKE TIME!!

- Information
- Function analysis [fast: as fast as possible]
- Idea generation
- Idea selection



- Write-up
- presentation